# ADVENTURES with ARITHMETIC

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**Tim:** Hi, Mom!
**Mother:** Hello, Son! How was school today?
**Tim:** Fine! We played a new game at recess time. It was fun.
**Mother:** What game was it?
**Tim:** Our teacher says it is a game that will help us to be good football players when we get to Junior High School. Even *girls* can play the game. Some of the girls were *good.*
**Mother:** It must have been fun. How was arithmetic today?
**Tim:** Awful!
**Mother:** Was it that bad?
**Tim:** Well, it wasn't good.
**Mother:** Any homework?
**Tim:** Plenty!

**Tim:** Mom, you know I like school a whole lot. I like to read. And spelling is easy. I get along fine in science, unless I have to use numbers. When I'm a man I think I'll be a salesman like Dad. I won't need arithmetic for that.

**Mother:** Now Tim, you know your father uses arithmetic often. You've gone with him on business trips now and then. You must have seen him use arithmetic at times.

**Tim:** I guess he does have to do some figuring once in a while. But, I never use arithmetic now. I can learn it when I'm older. I think I'll go out and play until dinnertime.

**Mother:** Just a minute, Tim. Everybody uses numbers and arithmetic almost every day. How about making a list of the times you've used arithmetic today? Start with waking up this morning.

Tim's list was like this:

1. Got up at 7:30.
2. Counted dishes for six people and set the table.
3. Cut grapefruit and prepared one half for each person. (How many grapefruit did Tim need? _____)
4. Got bread for toast and toasted two slices for each person. (How many slices did Tim toast? _____)
5. Counted out 35 cents to take to school for milk and supplies.
6. Looked up Ed's telephone number and called to tell him to bring his new football rule book.
7. Looked at the clock and figured I had 15 minutes for breakfast.

How have *you* used arithmetic, or numbers, today?

**Tim:** I know you are good in arithmetic, Polly. But do you ever use it?

**Polly:** Of course I do. I use it in games and when I spend money. I use it when I help Mother bake cookies and other things. Everybody uses numbers and arithmetic almost every day.

**Tim:** That's what Mom says. But, there's so much about it I don't understand.

**Polly:** What, for instance?

**Tim:** For one thing, I'm not sure what they mean when they talk about ones and tens. My teacher is always asking, "How many ones? How many tens? How many hundreds?"

**Polly:** I think I can show you. Let's play Tic-Tac-Toe.

**Tim:** How will that show me?

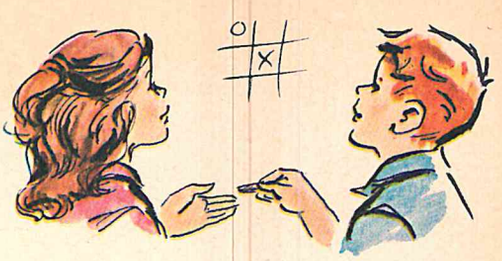
**Polly:** Here are three charts. When you win a game, put a mark in the ones' place on your chart.

**Tim:** That's simple. Then what?

**Polly:** When you have ten marks in the ones' place cross them off and put a mark in the tens' place.

**Tim:** I get it. And you'll do the same with your chart.

**Polly:** And when no one wins, we'll give the score to the Old Cat.



| hundreds | tens | ones |
|---|---|---|
| | 1 | //////// / |
| Tim's score ____ | | |

| hundreds | tens | ones |
|---|---|---|
| | | //////// |
| Polly's score ____ | | |

| hundreds | tens | ones |
|---|---|---|
| | | ///// |
| Old Cat's score ____ | | |

Tic-Tac-Toe is a fast game. Polly and Tim played it 24 times.

What were the scores?

Polly _____

Tim _____

Old Cat _____

Who was the winner? _____

Do *you* understand about place values?

**Two-place numbers have two figures.**

Read these:

35 means 3 tens and 5 more, or 3 tens and 5 ones.

75 means 7 tens and 5 more, or 7 tens and 5 ones.

14 means 1 ten and 4 more, or 1 ten and 4 ones.

**Three-place numbers have three figures.**

Read these:

246 means 2 hundreds and 4 tens and 6 ones.

108 means 1 hundred and no tens and 8 ones.

340 means 3 hundreds and 4 tens and no ones.

Write the numbers:

1 ten and 4 more _____

7 tens and 1 more _____

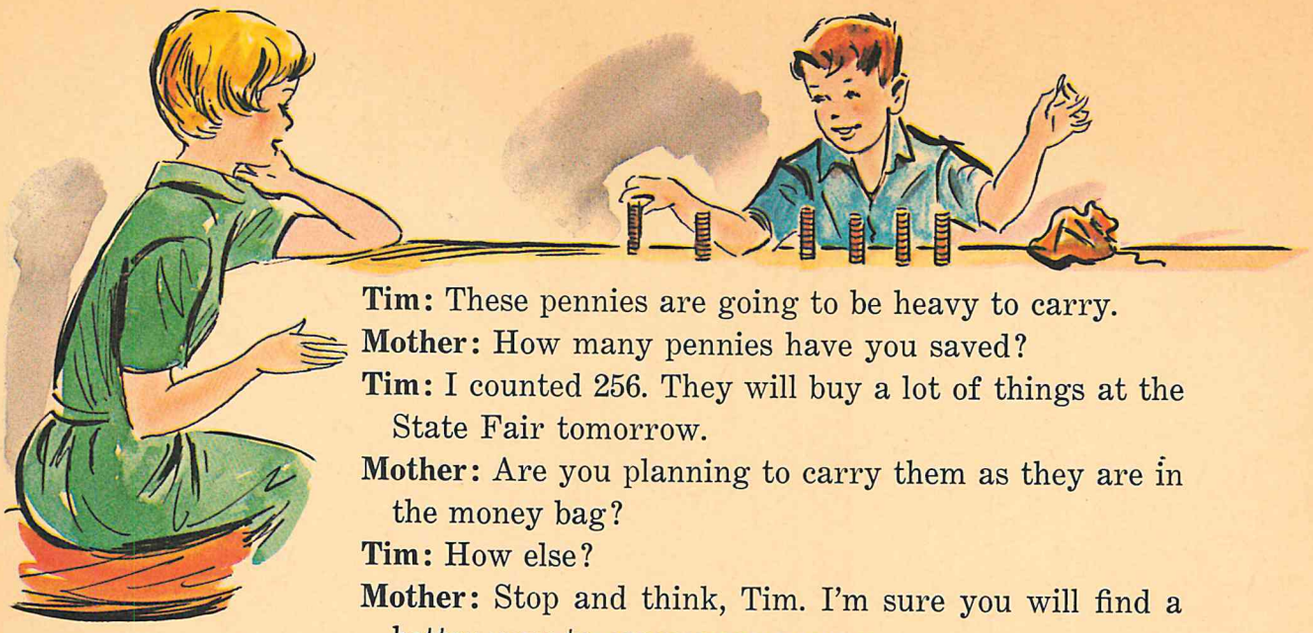
3 tens and 8 more _____

2 hundreds and 4 tens and 3 ones _____

1 hundred and 5 tens and no ones _____

3 hundreds and 2 tens and 6 ones _____

Check your answers with page 6.



**Tim:** These pennies are going to be heavy to carry.
**Mother:** How many pennies have you saved?
**Tim:** I counted 256. They will buy a lot of things at the State Fair tomorrow.
**Mother:** Are you planning to carry them as they are in the money bag?
**Tim:** How else?
**Mother:** Stop and think, Tim. I'm sure you will find a better way to carry your money.

Tim decided to have the 256 pennies changed into money that would be easier to carry. He figured it this way:

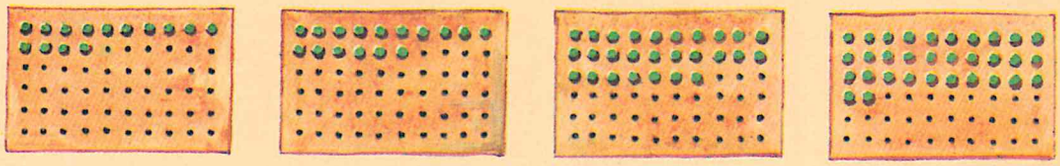
| hundreds | tens | ones |
|---|---|---|
| // | ///// | ////// |

Then he wrote it this way:

| hundreds | tens | ones |
|---|---|---|
| 2 | 5 | 6 |

His mother helped him to write it like this: $2.56

Tim wants to improve his dart game. He practices often. He keeps his score on a peg board, one peg for every score he makes. There are ten pegs in each row. What are Tim's scores?



Score ____ Score ____ Score ____ Score ____

Write these numbers in this place-value frame:

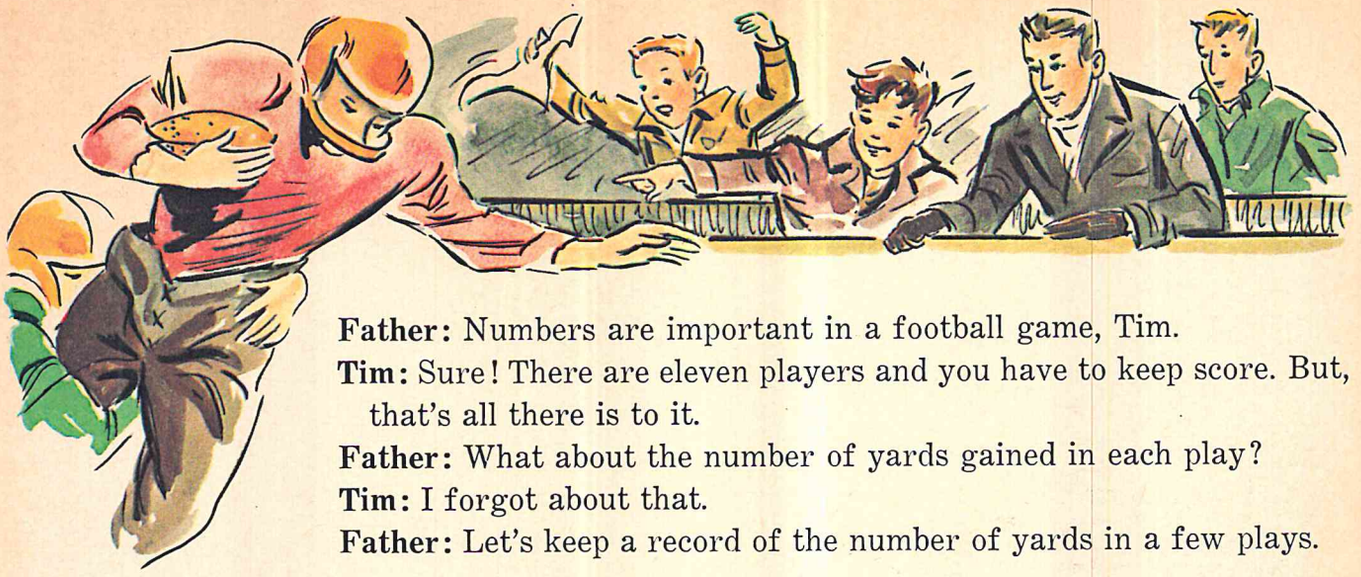
6 tens and 3 ones
2 hundreds and 5 tens and 6 ones
4 hundreds and 8 tens and 3 ones
1 ten and 7 ones
3 hundreds and 2 tens and 4 ones

| hundreds | tens | ones |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Write the numbers:

_____
_____
_____
_____
_____

Check your answers with page 8.



**Father:** Numbers are important in a football game, Tim.
**Tim:** Sure! There are eleven players and you have to keep score. But, that's all there is to it.
**Father:** What about the number of yards gained in each play?
**Tim:** I forgot about that.
**Father:** Let's keep a record of the number of yards in a few plays.

| HOME TEAM | | |
|---|---|---|
| hundreds | tens | ones |
| | // | //// |

| VISITORS | | |
|---|---|---|
| hundreds | tens | ones |
| | /// | ////// |

The home team had 2 ten-yard gains and 4 one-yard gains. This equals 24 yards.

The visitors had 3 ten-yard gains and 6 one-yard gains which made 36 yards for them.

It was an exciting game. Both teams played well.

Tim went to other football games. How many yards were gained in these plays?

| hundreds | tens | ones |
|---|---|---|
| | //// | /////// |

HOME TEAM - Yards _____

| hundreds | tens | ones |
|---|---|---|
| | /// | ////// |

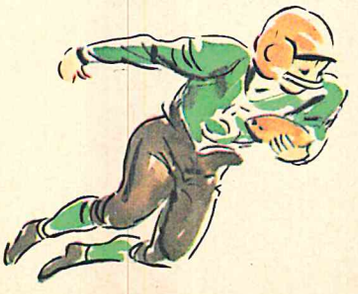
VISITORS - Yards _____

| hundreds | tens | ones |
|---|---|---|
| | // | / |

HOME TEAM - Yards _____

| hundreds | tens | ones |
|---|---|---|
| | ///// | // |

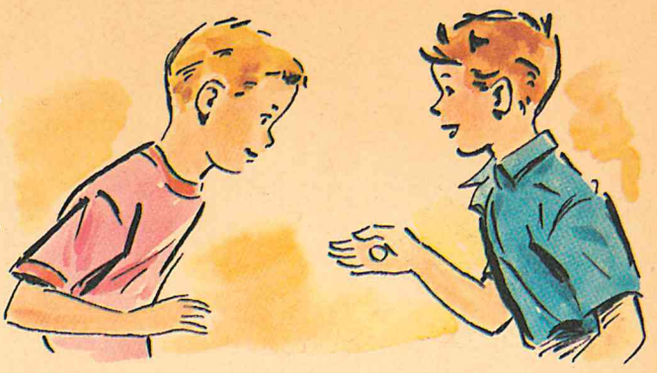
VISITORS - Yards _____



Answers for page 4: 14, 71, 38, 243, 150, 326

Answers for game on page 4: Polly—8, Tim—11, Old Cat—5

**Tim:** Hi, Bill!
**Bill:** Where are you going?
**Tim:** I'm going to the store. My grandmother gave me a quarter to spend.
**Bill:** Lucky you!
**Tim:** Come with me and I'll buy something for you.
**Bill:** You bet I'll go. Thanks, Pal.



**Tim:** Oh boy! Look at all the things. What will you have, Bill?
**Bill:** I'll have one of those candy bars.
**Tim:** All right, but I'd rather have three pieces for the same amount of money.
**Bill:** Are you buying bubble gum, too?
**Tim:** Yes, let's have two apiece. (How much did the bubble gum cost? _____)

**Clerk:** Here you are, boys. And here is your change. Come again.
**Bill:** Good-by. We'll be seeing you.

**Tim:** Look, Bill, he gave me back a dime.
**Bill:** He didn't give you enough. You were shortchanged.
**Tim:** I don't think so. People who work in stores know how to make change.
**Bill:** They make mistakes sometimes. You had better learn your addition and subtraction facts.

**Let's find out if Tim was shortchanged.**

They bought:
1 candy bar ..... $.05
3 pieces of candy ..... .05
4 pieces of bubble gum ..... .04
Total...

Tim gave the clerk a quarter.
That is 25¢. He spent 14¢.
Take 14¢ from 25¢.

25¢
−14¢

How much change should Tim have had? _____
Was he shortchanged? _____ How much? _____

Tim decided Bill was right. He reviewed the addition and the subtraction facts. He studied those he wasn't sure of until he knew them perfectly. It took time, but Tim did it.

How well do you know the addition facts?
Test yourself.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 +1 | 1 +0 | 2 +0 | 1 +6 | 3 +3 | 1 +4 | | | | | |
| 2 +2 | 2 +1 | 1 +2 | 3 +1 | 5 +5 | 1 +3 | | | | | |
| 8 +1 | 7 +1 | 9 +0 | 0 +0 | 6 +1 | 4 +0 | 1 +8 | 4 +1 | 8 +0 | 3 +2 | 7 +7 |
| 1 +7 | 1 +5 | 5 +2 | 0 +3 | 0 +4 | 5 +0 | 0 +6 | 2 +9 | 9 +1 | 0 +1 | 6 +6 |
| 5 +1 | 0 +5 | 6 +0 | 5 +4 | 7 +0 | 0 +2 | 2 +4 | 1 +9 | 2 +3 | 0 +8 | 4 +2 |
| 3 +0 | 4 +4 | 0 +7 | 7 +2 | 0 +9 | 4 +5 | 2 +8 | 9 +2 | 4 +3 | 2 +7 | 8 +3 |
| 8 +2 | 8 +8 | 5 +3 | 6 +4 | 3 +5 | 6 +2 | 3 +4 | 7 +3 | 3 +7 | 3 +9 | 4 +8 |
| 3 +8 | 6 +3 | 8 +4 | 6 +7 | 3 +6 | 4 +6 | 9 +9 | 2 +6 | 5 +7 | 9 +3 | 2 +5 |
| 7 +4 | 6 +5 | 9 +4 | 9 +5 | 5 +6 | 7 +5 | 8 +6 | 7 +6 | 8 +9 | 4 +9 | 4 +7 |
| 9 +8 | 6 +8 | 5 +8 | 8 +7 | 7 +8 | 5 +9 | 9 +6 | 6 +9 | 9 +7 | 7 +9 | 8 +5 |

Check the answers with the addition facts on page 76.

Answers for page 5: 63, 256, 483, 17, 324

**Tim:** Hey, Mom! Subtraction is a lot easier now that I am sure of all of the addition facts.

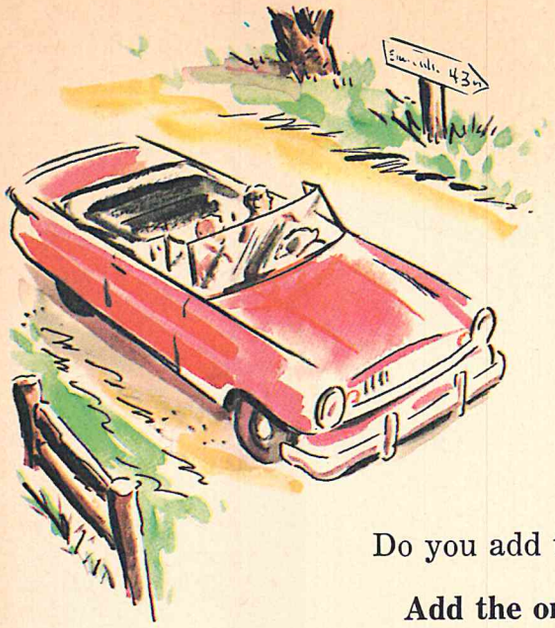
**Mother:** Do you know, Tim, that when you have learned an addition fact for a number, you have learned two subtraction facts for that number?

Can you write the answers to these subtraction problems?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 4<br>−3 | 3<br>−1 | 8<br>−1 | 4<br>−2 | 9<br>−8 | 10<br>−5 | 9<br>−1 | 2<br>−1 | 0<br>−0 | 3<br>−2 |
| 7<br>−6 | 11<br>−5 | 2<br>−0 | 4<br>−0 | 7<br>−1 | 5<br>−1 | 8<br>−0 | 5<br>−2 | 8<br>−7 | 6<br>−3 |
| 6<br>−5 | 8<br>−4 | 5<br>−0 | 7<br>−0 | 11<br>−6 | 7<br>−7 | 12<br>−4 | 12<br>−6 | 5<br>−4 | 10<br>−2 |
| 6<br>−2 | 8<br>−6 | 3<br>−0 | 6<br>−0 | 3<br>−3 | 9<br>−0 | 5<br>−5 | 2<br>−2 | 6<br>−1 | 8<br>−8 |
| 1<br>−1 | 10<br>−9 | 4<br>−4 | 5<br>−3 | 6<br>−6 | 6<br>−4 | 9<br>−6 | 7<br>−2 | 9<br>−2 | 7<br>−3 |
| 11<br>−3 | 8<br>−3 | 16<br>−8 | 9<br>−7 | 8<br>−5 | 10<br>−8 | 9<br>−3 | 11<br>−8 | 7<br>−5 | 7<br>−4 |
| 4<br>−1 | 9<br>−9 | 14<br>−7 | 10<br>−1 | 1<br>−0 | 9<br>−5 | 10<br>−3 | 8<br>−2 | 12<br>−5 | 13<br>−5 |
| 12<br>−8 | 12<br>−9 | 11<br>−2 | 13<br>−6 | 11<br>−4 | 10<br>−7 | 9<br>−4 | 10<br>−6 | 18<br>−9 | 10<br>−4 |
| 12<br>−3 | 17<br>−8 | 13<br>−4 | 14<br>−5 | 11<br>−7 | 17<br>−9 | 11<br>−9 | 13<br>−9 | 13<br>−7 | 14<br>−6 |
| 14<br>−9 | 12<br>−7 | 14<br>−8 | 15<br>−6 | 15<br>−8 | 15<br>−7 | 15<br>−9 | 16<br>−7 | 13<br>−8 | 16<br>−9 |

Check your answers with page 77.

If you are sure of all addition and subtraction facts, the rest of this book will be fun for you.




**Tim:** I'm lucky to get to take this trip with you today, Dad.
**Father:** I'm glad it's Saturday so you can go.
**Tim:** Is it really 43 miles to Smithville?
**Father:** Yes, 43 miles to Smithville and 43 miles home again.
**Tim:** How many miles is that both ways?
**Father:** Just add 43 and 43 and you will know.
**Tim:** I'm not sure how to add numbers as big as that.
**Father:** Let's stop for a cold drink and I'll show you.

Do you add two-place numbers this way? **Add the ones first, then add the tens.**

| tens | ones |
|---|---|
| 4 | 3 |
| +4 | 3 |
| 8 | 6 |

$$\begin{array}{r} 43 \\ +43 \\ \hline 86 \end{array}$$

Can you add two-place numbers this way? Try it.

Row A

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32 | 27 | 86 | 74 | 50 | 43 | 65 | 98 | 42 | 65 |
| +41 | +32 | +13 | +25 | +47 | +56 | +31 | +11 | +56 | +44 |

**Add three-place numbers the same way. Add the ones, then the tens, then the hundreds. Try it.**

Row B

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 134 | 341 | 256 | 470 | 653 | 563 | 714 | 802 | 359 |
| +245 | +237 | +840 | +329 | +436 | +225 | +453 | +176 | +340 |

Add these numbers from the bottom up. Then add down to check your answers.

Row C

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 56 | 71 | 80 | 54 | 53 | 44 | 43 | 60 | 67 | 32 | 87 |
| +30 | +43 | +40 | +24 | +43 | +30 | +52 | +37 | +12 | +45 | +70 |

Row D

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 456 | 400 | 638 | 405 | 788 | 638 | 690 | 640 | 403 |
| +423 | +500 | +520 | +580 | +600 | +520 | +400 | +340 | +502 |

Row E

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 407 | 780 | 434 | 529 | 903 | 502 | 656 | 876 | 856 |
| +660 | +405 | +355 | +670 | +576 | +896 | +713 | +722 | +430 |

When you have solved the problems and checked your answers, turn to page 14 and look at the answers. If you made any mistakes, review the addition facts on page 76.

**Polly:** Did I have fun yesterday!

**Tim:** What did you do that was so exciting?

**Polly:** My father took me with him on a trip. We drove 71 miles.

**Tim:** That's nothing. I went to Smithville with my dad. It was 43 miles each way. That's 86 miles both ways.

**Polly:** You went farther than I did. Do you know how much farther?

**Tim:** I know I should subtract, but how do I subtract two-place numbers?

**Polly:** Here, I'll show you. Write 86, then write 71 under it. Subtract the ones first, then subtract the tens.

**Tim:** Is that all there is to it? The answer is 15. I went 15 miles farther than you did.

Can *you* subtract two-place numbers?

**When subtracting two-place numbers, subtract the ones first, then subtract the tens.**

Row A

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 65 | 98 | 75 | 54 | 47 | 39 | 79 | 82 | 67 | 85 |
| −34 | −36 | −24 | −13 | −26 | −18 | −57 | −60 | −47 | −82 |

**When subtracting three-place numbers, subtract the ones, then the tens, then the hundreds.**

Can *you* subtract three-place numbers?

Row B

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 654 | 875 | 345 | 795 | 863 | 271 | 456 | 768 | 937 |
| −231 | −652 | −132 | −634 | −602 | −160 | −214 | −354 | −807 |

More Practice in Subtraction

Row C

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 64 | 88 | 96 | 28 | 72 | 86 | 39 | 26 | 49 | 94 |
| −43 | −35 | −85 | −16 | −52 | −64 | −15 | −16 | −27 | −82 |

Row D

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 326 | 896 | 849 | 457 | 879 | 535 | 287 | 495 | 195 |
| −115 | −253 | −338 | −136 | −656 | −14 | −155 | −342 | −54 |

Can you subtract a two-place number from a three-place number? Look at the first problem. Now do the others.

Row E

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 251 | 432 | 645 | 237 | 943 | 158 | 380 | 537 | 549 |
| −30 | −21 | −23 | −14 | −12 | −40 | −70 | −15 | −25 |
| 221 | | | | | | | | |

Check your answers on page 16. If you made any errors, study the subtraction facts on page 77.

**Bill:** My mother brought 38 cookies to this meeting. I counted them.

**Tim:** I didn't count ours, but *my* mother said she brought 45 cookies. And, are they good!

**Bill:** Our cookies have nuts in them.

**Tim:** I like chocolate better than nuts.

**Bill:** Aw! Let's quit arguing and find out how many cookies we have for the meeting.

**Tim:** That means adding and carrying and I get mixed up when I do that.

| hundreds | tens | ones |
|---|---|---|
| | 4 | 5 |
| +3 | 8 | |
| 8 | 3 | |

38
+45
83

Could *you* have helped Tim to add and carry?

45 means 4 tens and 5 ones.
38 means 3 tens and 8 ones.
7 tens and 13 ones = 8 tens and 3 ones = 83.

Carry the tens from the ones' column to the tens' column.
Carry the hundreds from the tens' column to the hundreds' column.
Can *you* add these columns? Remember to *carry*.

Row A

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 14 | 56 | 27 | 64 | 32 | 52 | 19 | 36 | 48 | 73 |
| 35 | 31 | 56 | 46 | 62 | 25 | 13 | 12 | 30 | 24 |
| +26 | +54 | +24 | +15 | +28 | +37 | +33 | +54 | +56 | +35 |

Row B

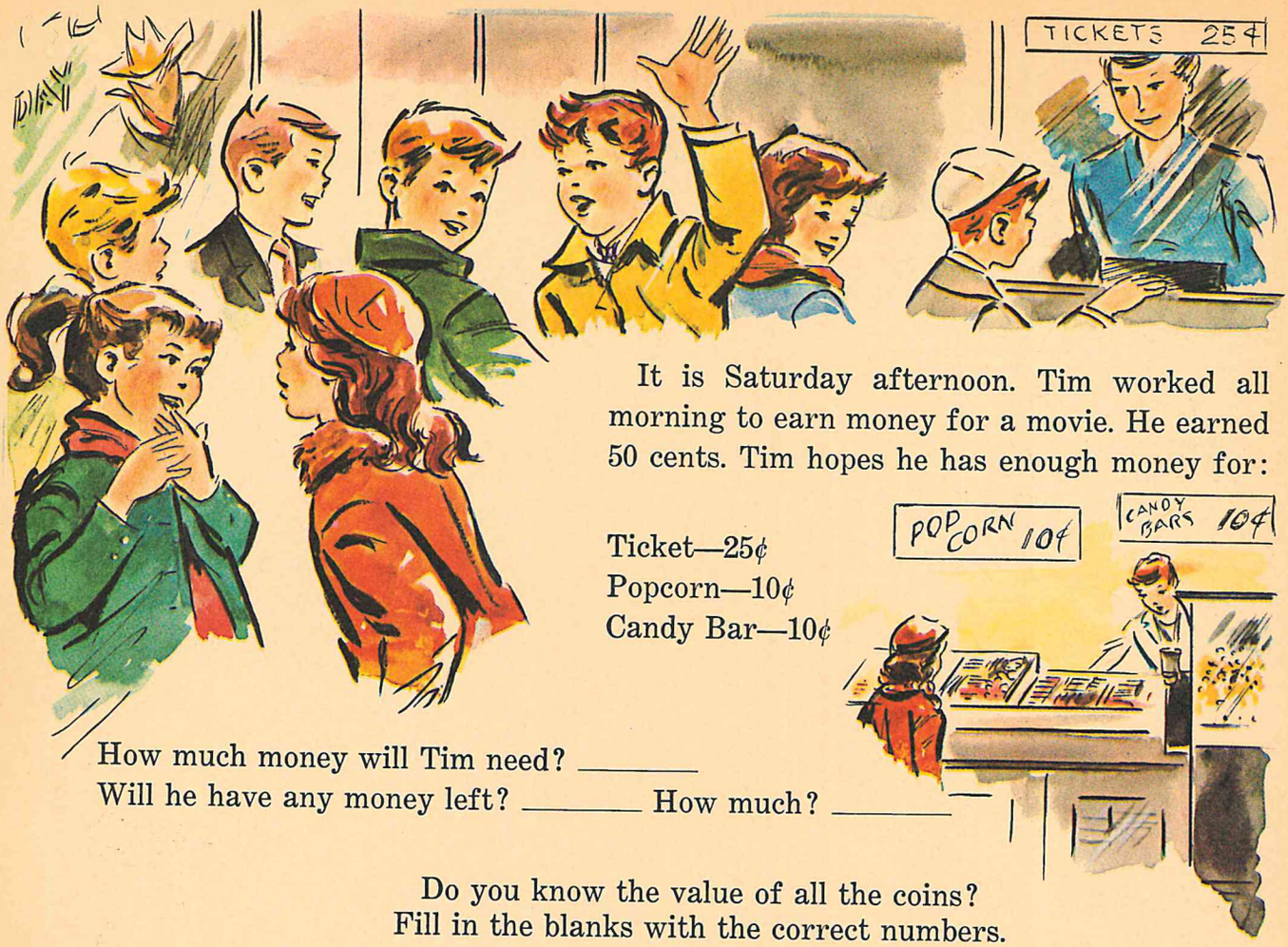
| | | | | | |
|---|---|---|---|---|---|
| $1.27 | $3.08 | $ .36 | $5.31 | $2.67 | $4.62 | $3.25 |
| +.34 | +.44 | +4.27 | +1.09 | +3.24 | +5.73 | +.89 |

Tim likes to add long columns. Do you?

Row C

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 8 | 5 | 3 | 4 | 7 | 6 | 5 | 1 | 2 | 9 | 3 |
| 3 | 2 | 0 | 8 | 5 | 8 | 2 | 4 | 7 | 4 | 3 | 2 |
| 6 | 5 | 8 | 4 | 3 | 2 | 0 | 6 | 9 | 1 | 6 | 9 |
| +4 | +3 | +9 | +2 | +1 | +0 | +3 | +2 | +2 | +5 | +4 | +5 |

Check the answers. Add up each column, then add down. Then check the answers with page 21.




It is Saturday afternoon. Tim worked all morning to earn money for a movie. He earned 50 cents. Tim hopes he has enough money for:

Ticket—25¢
Popcorn—10¢
Candy Bar—10¢




How much money will Tim need? _____
Will he have any money left? _____ How much? _____

Do you know the value of all the coins?
Fill in the blanks with the correct numbers.

1 nickel equals _____ pennies

1 dime equals _____ nickels

1 quarter equals _____ nickels

1 half dollar equals _____ pennies

1 half dollar equals _____ nickels

1 dollar equals _____ pennies

1 dollar equals _____ quarters

10 pennies equal _____ nickels

1 quarter equals _____ pennies

1 dime equals _____ pennies

1 half dollar equals _____ dimes

1 half dollar equals _____ quarters

1 dollar equals _____ half dollars

1 dollar equals _____ nickels

Practice adding money.

| | | | | | | |
|---|---|---|---|---|---|---|
| $5.25 | $8.07 | $6.14 | $2.39 | $4.36 | $3.40 | $ .89 |
| .34 | 1.64 | .89 | .72 | .72 | 1.27 | 1.27 |
| +3.12 | +.95 | +2.50 | +.41 | 1.04 | .36 | .30 |
| | | | | +.53 | +.54 | +2.06 |

Check your answers with page 19.

**Tim:** Mom, Bill's dog, Peanuts, weighs only 14 pounds. Our Topper weighs 31 pounds. That's a lot more.

**Mother:** How much more, Tim?

**Tim:** I suppose I could subtract and find out. But I don't like problems where I have to borrow. I like everything else about arithmetic but that.

**Mother:** I'll help you, Tim. It's not so hard.

One of the tens is changed to 10 ones. Add that to the ones. Then put the total number of ones in the ones' place. Be sure to subtract the 10 you take away from the tens' place.

| tens | ones |
|---|---|
| 3 | 1 |
| − 1 | 4 |

or

| tens | ones |
|---|---|
| \|\|\| | 1 |
| 1 | \|\|\|\| |

or

| tens | ones |
|---|---|
| 11 | \|\|\|\|\|\|\|\|\|\| |
| 1 | \|\|\|\| |
| 1 | \|\|\|\|\|\|\| |

or 17

$$\begin{array}{r} 31 \\ -14 \\ \hline 17 \end{array}$$

| tens | ones |
|---|---|
| 4 | 5 |
| −2 | 6 |

or

| tens | ones |
|---|---|
| \|\|\|\| | \|\|\|\|\| |
| 11 | \|\|\|\|\|\| |

or

| tens | ones |
|---|---|
| \|\|\| | \|\|\|\|\|\|\|\|\|\|\|\|\|\| |
| 11 | \|\|\|\|\|\| |
| 1 | \|\|\|\|\|\|\|\|\| |

or 19

$$\begin{array}{r} 45 \\ -26 \\ \hline 19 \end{array}$$

It is easy to check subtraction. Let's subtract 14 from 31. The large number is the *minuend*. The number you subtract from the minuend is the *subtrahend*. The answer is called the *difference*.

| | |
|---|---|
| Minuend | **31** |
| Subtrahend | **−14** |
| Difference | **17** |

| | | |
|---|---|---|
| Add | Subtrahend | **14** |
| | Difference | **+17** |
| | Minuend | **31** |

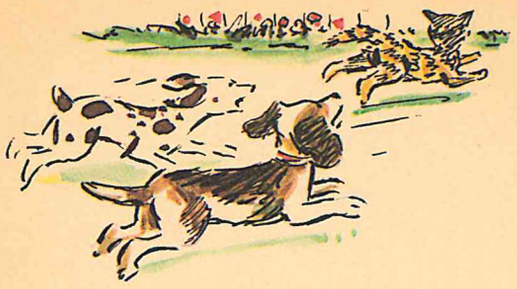
**To check the answer in subtraction, add the subtrahend to the difference. The answer should be the minuend.**

Tim practiced borrowing when he worked the following problems. Then he checked his answers. Can you do it?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **34** | **63** | **51** | **72** | **84** | **45** | **91** | **23** | **36** | **52** |
| **−15** | **−26** | **−34** | **−43** | **−57** | **−38** | **−36** | **−9** | **−7** | **−9** |

Check your answers with page 22.

Answers to problems on page 10: Row A—73, 59, 99, 99, 97, 99, 96, 109, 98, 109 Row B—379, 578, 1096, 799, 1089, 788, 1167, 978, 699 Row C—86, 114, 120, 78, 96, 74, 95, 97, 79, 77, 157 Row D—879, 900, 1158, 985, 1388, 1158, 1090, 980, 905 Row E—1067, 1185, 789, 1199, 1479, 1398, 1369, 1598, 1286



**Bill:** Did you see that cat run?

**Tim:** A jet plane has nothing on her when it comes to speed.

**Bill:** Peanuts and Topper certainly chased her.

**Tim:** I wonder how far they chased her.

**Bill:** Let's measure and find out.

**Tim:** Peanuts chased her 237 feet and Topper got into the act at 142 feet.

**Bill:** I wonder how much farther swift little Peanuts ran than big, handsome Topper.

**Tim:** Let's subtract and find out. Subtraction is easy for me now that I understand about borrowing.

| hundreds | tens | ones |
|---|---|---|
| 2 | 3 | 7 |
| − 1 | 4 | 2 |
| | | |

or

| hundreds | tens | ones |
|---|---|---|
| 11 | 111 | 1111111 |
| 1 | 1111 | 11 |
| | | |

or

| hundreds | tens | ones |
|---|---|---|
| 1 | 1111111111111 | 1111111 |
| 1 | 1111 | 11 |
| | 1111111111 | 11111 |

237
−142
95

**When subtracting three-place numbers, borrow from the hundreds and add to the tens.**

$$\begin{array}{r} 237 \\ -142 \\ \hline 95 \end{array}$$

Check your problem this way:

$$\begin{array}{r} 142 \\ +95 \\ \hline 237 \end{array}$$

How much farther did Peanuts run than Topper? _____ feet

Practice borrowing in subtraction:

| | | | | | |
|---|---|---|---|---|---|
| 43 | 36 | 15 | 27 | 48 | |
| −15 | −27 | −9 | −18 | −29 | |
| | | | | | |
| 245 | 437 | 534 | 362 | 613 | 218 | 729 | 851 |
| −153 | −264 | −416 | −280 | −546 | −165 | −673 | −462 |
| | | | | | | | |
| 482 | 734 | 345 | 623 | 456 | 927 | 321 | 518 |
| −315 | −642 | −136 | −208 | −361 | −637 | −161 | −426 |
| | | | | | | | |

Check each problem by adding the subtrahend and the difference. Then check the answers with page 18.

**Tim:** When is Dad coming home from New York?
**Mother:** He is coming today. He will be here when you get home from school.
**Tim:** Do you think he will bring us any presents?
**Mother:** He usually does. Let's wait and see.

**Tim:** Thanks, Dad. One of the boys had a book like this at school today.
**Father:** We'll all have fun with the number puzzles.

Add the numbers *across*. Write one figure of the answer in each square. The number at the left of the problem tells you where to write the first figure of the answer. Add the numbers *down* and write the answers in the squares going down.

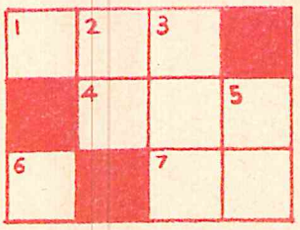
Example:

**Across:** (1) $114 + 159 = 273$
(4) $77 + 115 = 192$
(6) $6 + 0 = 6$
(7) $9 + 5 = 14$

| | | | |
|---|---|---|---|
| 1 2 | 2 7 | 3 3 | |
| | 4 1 | 9 | 5 2 |
| 6 6 | | 7 1 | 4 |

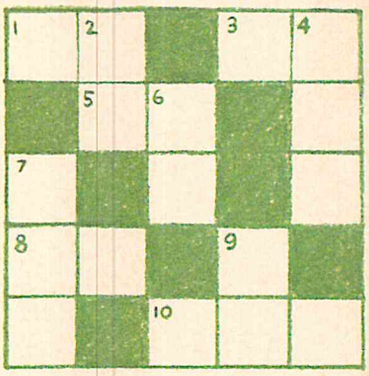
**Down:** (2) $59 + 12 = 71$
(3) $246 + 145 = 391$
(5) $11 + 13 = 24$

Tim worked the number puzzle that is shown as an example. Do you understand how he did it? Why don't you have fun doing these number puzzles?



**Across:** (1) $301 + 20 =$
(4) $143 + 113 =$
(6) $5 + 3 =$
(7) $22 + 12 =$

**Down:** (2) $10 + 12 =$
(3) $75 + 78 =$
(5) $39 + 25 =$

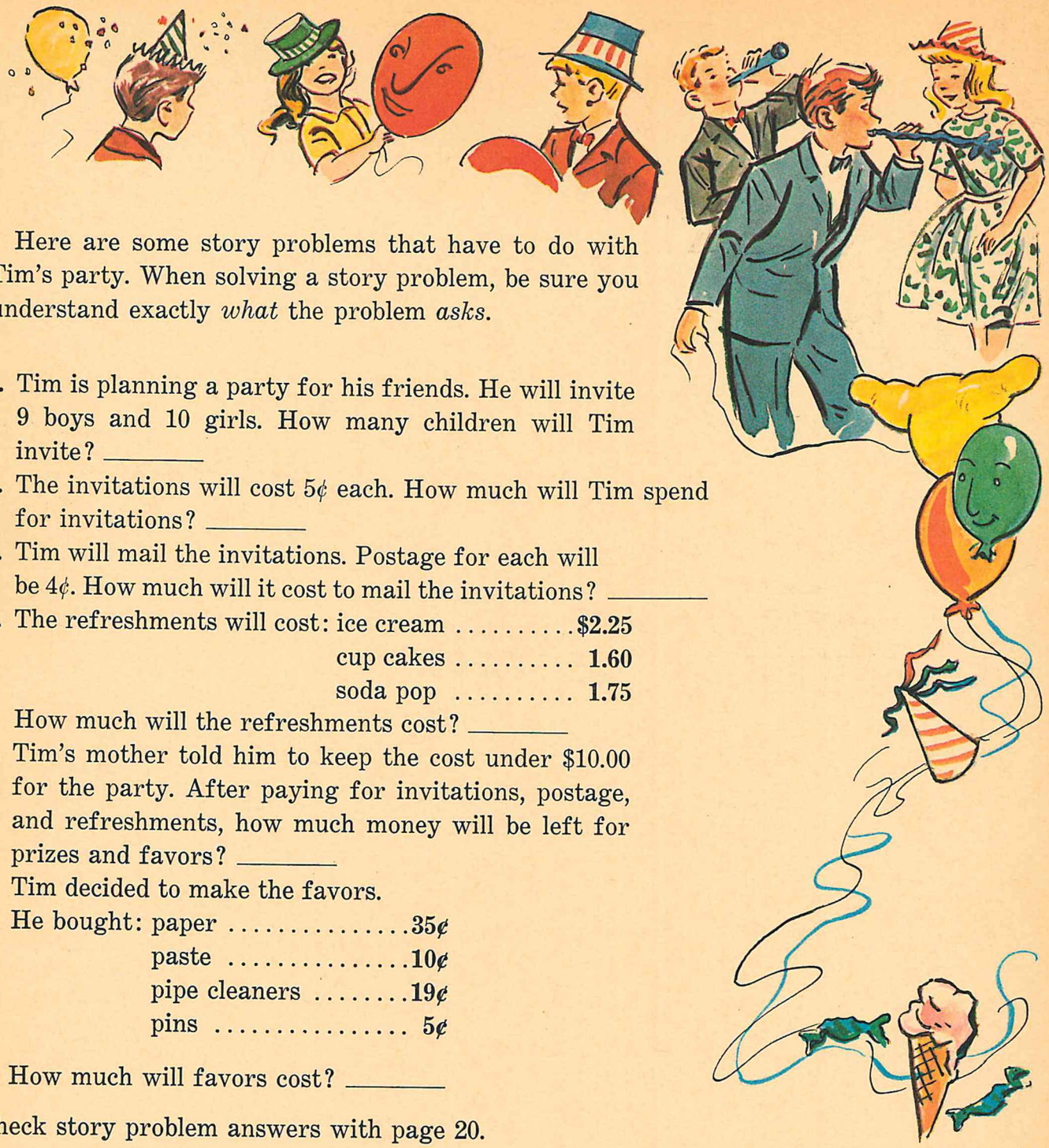


**Across:** (1) $26 + 13 =$
(3) $52 + 35 =$
(5) $33 + 12 =$
(8) $19 + 7 =$
(10) $275 + 197 =$

**Down:** (2) $61 + 33 =$
(4) $245 + 519 =$
(6) $25 + 26 =$
(7) $411 + 212 =$
(9) $60 + 37 =$

Check the puzzle answers with page 34.

Answers to problems on page 11: Row A—31, 62, 51, 41, 21, 21, 22, 22, 20, 3 Row B—423, 223, 213, 161, 261, 111, 242, 414, 130 Row C—21, 53, 11, 12, 20, 22, 24, 10, 22, 12 Row D—211, 643, 511, 321, 223, 521, 132, 153, 141 Row E—221, 411, 622, 223, 931, 118, 310, 522, 524



Here are some story problems that have to do with Tim's party. When solving a story problem, be sure you understand exactly *what* the problem *asks*.

1. Tim is planning a party for his friends. He will invite 9 boys and 10 girls. How many children will Tim invite? _____
2. The invitations will cost 5¢ each. How much will Tim spend for invitations? _____
3. Tim will mail the invitations. Postage for each will be 4¢. How much will it cost to mail the invitations? _____
4. The refreshments will cost: ice cream ..... **$2.25**
   cup cakes ..... **1.60**
   soda pop ..... **1.75**
   How much will the refreshments cost? _____
5. Tim's mother told him to keep the cost under $10.00 for the party. After paying for invitations, postage, and refreshments, how much money will be left for prizes and favors? _____
6. Tim decided to make the favors.
   He bought: paper .....**35¢**
   paste .....**10¢**
   pipe cleaners .....**19¢**
   pins ..... **5¢**

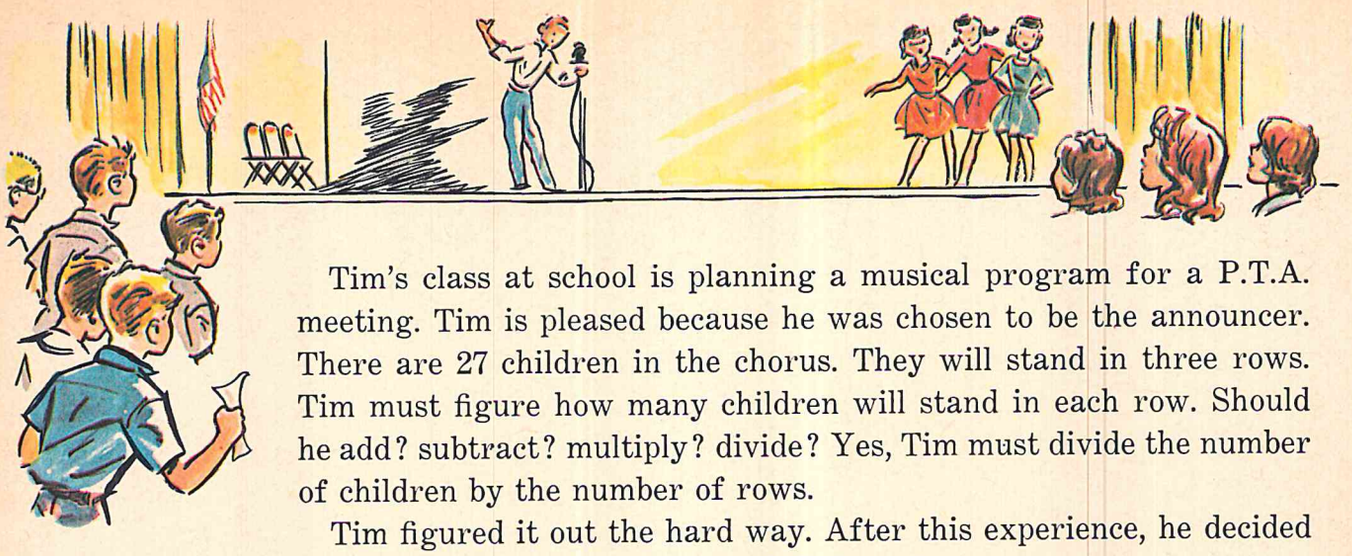
   How much will favors cost? _____

Check story problem answers with page 20.

More Practice Problems in Subtraction

| | | | | | | |
|---|---|---|---|---|---|---|
| **$5.67** | **$7.36** | **$6.49** | **$3.41** | **$2.95** | **$8.23** | **$9.64** |
| **—3.25** | **—5.45** | **—3.62** | **—1.32** | **—1.89** | **—.65** | **—7.85** |

Be sure to check your problems as you did on page 14, then check the answers with page 18.



Tim's class at school is planning a musical program for a P.T.A. meeting. Tim is pleased because he was chosen to be the announcer. There are 27 children in the chorus. They will stand in three rows. Tim must figure how many children will stand in each row. Should he add? subtract? multiply? divide? Yes, Tim must divide the number of children by the number of rows.

Tim figured it out the hard way. After this experience, he decided to review the multiplication and division facts.

Let's review multiplication facts.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 0 | 1 | 2 | 3 | 4 | 5 |
| ×1 | ×1 | ×1 | ×1 | ×1 | ×1 | ×2 | ×2 | ×2 | ×2 | ×2 | ×2 |
| 0 | 1 | 2 | 3 | 4 | 5 | 0 | 1 | 2 | 3 | 4 | 5 |
| ×3 | ×3 | ×3 | ×3 | ×3 | ×3 | ×4 | ×4 | ×4 | ×4 | ×4 | ×4 |
| 0 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 0 |
| ×5 | ×5 | ×5 | ×5 | ×5 | ×5 | ×0 | ×0 | ×0 | ×0 | ×0 | ×0 |

Check your answers with page 78.

When you have learned a multiplication fact, you have learned two division facts. Example:

$4 \times 5 = 20$ $\quad 20 \div 4 = 5$ $\quad 20 \div 5 = 4$

How well do you know your division facts?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $1/\overline{0}$ | $1/\overline{1}$ | $1/\overline{2}$ | $1/\overline{3}$ | $1/\overline{4}$ | $1/\overline{5}$ | $2/\overline{0}$ | $2/\overline{2}$ | $2/\overline{4}$ | $2/\overline{6}$ |
| $2/\overline{8}$ | $2/\overline{10}$ | $3/\overline{0}$ | $3/\overline{3}$ | $3/\overline{6}$ | $3/\overline{9}$ | $3/\overline{12}$ | $3/\overline{15}$ | $4/\overline{0}$ | $4/\overline{4}$ |
| $4/\overline{8}$ | $4/\overline{12}$ | $4/\overline{16}$ | $4/\overline{20}$ | $5/\overline{0}$ | $5/\overline{5}$ | $5/\overline{10}$ | $5/\overline{15}$ | $5/\overline{20}$ | $5/\overline{25}$ |

Check your answers with page 79.

Answers to problems on page 15: 28, 9, 6, 9, 19, 92, 173, 118, 82, 67, 53, 56, 389, 167, 92, 209, 415, 95, 290, 160, 92

Answers to problems on page 17: $2.42, $1.91, $2.87, $2.09, $1.06, $7.58, $1.79

**Tim:** It takes a lot of practice to put the ball in just the right place every time.

**Bill:** It certainly *does* take practice. And that's true about lots of other things, too.

**Tim:** I suppose you mean *arithmetic*. The more I practice *that*, the better I become.

Practice what you have learned by solving these problems:

Row A

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32 | 28 | 15 | 29 | 46 | 50 | 117 | 245 | 86 | 92 |
| 47 | 63 | 84 | 52 | 71 | 239 | 28 | 136 | 27 | 154 |
| +51 | +70 | +66 | +37 | +305 | +76 | +103 | +74 | +39 | +307 |

Row B

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 356 | 876 | 649 | 35 | 83 | 72 | 214 | 521 | 730 | 321 |
| −143 | −564 | −537 | −27 | −56 | −68 | −132 | −416 | −515 | −242 |

Check these answers with page 38.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 5 | 6 | 8 | 9 | 4 | 0 | 1 | 2 | 3 | 7 | 5 |
| ×2 | ×2 | ×4 | ×3 | ×5 | ×3 | ×2 | ×4 | ×4 | ×5 | ×3 | ×5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4/28 | 3/18 | 2/18 | 5/40 | 5/25 | 3/27 | 4/32 | 2/14 | 4/0 |
| 5/15 | 2/16 | 4/20 | 3/9 | 5/20 | 3/21 | 5/30 | 2/10 | 4/12 |

Check these answers with pages 78 and 79.

1. Tim practiced kicking the football 30 minutes on Monday, 15 minutes on Tuesday, and 25 minutes on Thursday. How many minutes did he practice these three days? _____
2. Tim kicked the ball between and over the goal posts 42 times. He missed 28 times. How many times did he succeed? _____
3. Bill missed 34 times out of the 42 times that he tried. How many times did Bill get the ball over? _____
4. It took Tim 6 minutes to work the above football problems. Bill worked them in 4 minutes. How much longer did Tim work than Bill? _____

Check the answers with page 20.

Answers for page 13: 1 nickel = 5¢, 1 dime = 2 nickels, 1 quarter = 5 nickels, 1 half dollar = 50 pennies, 1 half dollar = 10 nickels, 1 dollar = 100 pennies, 1 dollar = 4 quarters, 10 pennies = 2 nickels, 1 quarter = 25 pennies, 1 dime = 10 pennies, 1 half dollar = 5 dimes, 1 half dollar = 2 quarters, 1 dollar = 2 half dollars, 1 dollar = 20 nickels, $8.71, $10.66, $9.53, $3.52, $6.65, $5.57, $4.52

**Tim:** That clerk certainly adds fast. I bought six cones at 8¢ each. I had only added 6 + 6 = 12 + 6 = when she said, "That will be 48 cents."

**Bill:** She didn't add. She multiplied. It's much faster.

**Tim:** I wish I could do that.

**Bill:** My friend, all you have to do is to sit down and learn the multiplication facts for the 6 table.

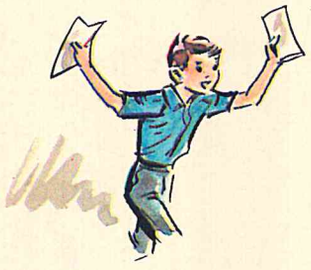
Multiplication is a short way to add numbers. Do *you* know the multiplication facts for 6?

| | |
|---|---|
| $0 \times 6 = 0$ | $5 \times 6 = 30$ |
| $1 \times 6 = 6$ | $6 \times 6 = 36$ |
| $2 \times 6 = 12$ | $7 \times 6 = 42$ |
| $3 \times 6 = 18$ | $8 \times 6 = 48$ |
| $4 \times 6 = 24$ | $9 \times 6 = 54$ |

When you are sure you have learned the 6 table, cover it and work these multiplication problems:

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 3 | 0 | 8 | 7 | 5 | 2 | 4 | 1 | 6 | 9 | 6 | 6 |
| ×6 | ×6 | ×6 | ×6 | ×6 | ×6 | ×6 | ×6 | ×6 | ×2 | ×6 | ×8 | ×5 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 1 | 6 | 0 | 5 | 6 | 4 | 7 | 8 | 6 | 6 | 9 | 2 |
| ×0 | ×6 | ×3 | ×6 | ×6 | ×6 | ×6 | ×6 | ×6 | ×9 | ×5 | ×6 | ×6 |



**Tim:** Mom! Dad! Whoopee! I know the 6 table. Whee!

**Father:** Wonderful! And, don't forget that when you learn one multiplication fact you learn two division facts.

**Tim:** Yes, arithmetic is easy once you get onto it. Learning one thing helps me to know lots of other things. Dividing by 6 is a snap.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $6\overline{0}$ | $6\overline{6}$ | $6\overline{12}$ | $6\overline{18}$ | $6\overline{24}$ | $6\overline{30}$ | $6\overline{36}$ | $6\overline{42}$ | $6\overline{48}$ | $6\overline{54}$ |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

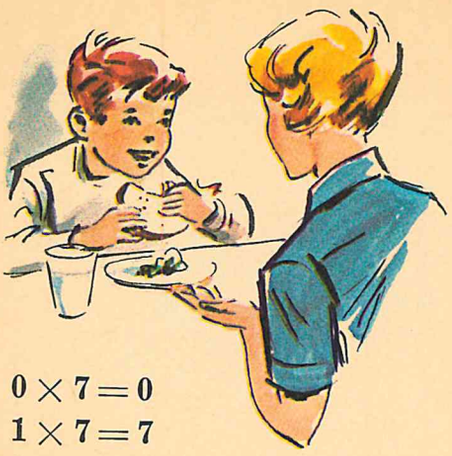
We know these answers are correct because when we multiply the divisor by the quotient, the answer is the same as the dividend. Can *you* divide by 6? It will be easy if you know the 6 table.

$6\overline{54}$ $6\overline{18}$ $6\overline{0}$ $6\overline{42}$ $6\overline{12}$ $6\overline{24}$ $6\overline{48}$ $6\overline{6}$ $6\overline{30}$ $6\overline{36}$

Check the answers by multiplying.

Answers to story problems on page 17: (1) 19 children, (2) 95¢, (3) 76¢, (4) $5.60, (5) $2.69, (6) 69¢

Answers to story problems on page 19: (1) 70 min. (2) 14, (3) 8, (4) 2 min.



**Tim:** While I'm all steamed up I'm going to have a little snack. Then I want to learn the 7 table.

**Mother:** Good for you, Tim. Your dad and I are pleased with your interest in arithmetic.

**Tim:** Pretty soon I may be as good as Bill. That will be the day!

$0 \times 7 = 0$
$1 \times 7 = 7$
$2 \times 7 = 14$
$3 \times 7 = 21$
$4 \times 7 = 28$
$5 \times 7 = 35$
$6 \times 7 = 42$
$7 \times 7 = 49$
$8 \times 7 = 56$
$9 \times 7 = 63$

Here is another table of 7's. Write the answers in the squares. Then check your answers two ways—across and down.

| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 2×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 3×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 4×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 7×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 8×7= | | +7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 9×7= | | | | | | | | | |

Cover the 7 table and multiply.

$$\begin{array}{rrrrrrrrrr} 8 & 5 & 7 & 0 & 1 & 3 & 6 & 2 & 4 & 9 \\ \times 7 & \times 7 & \times 7 & \times 7 & \times 7 & \times 7 & \times 7 & \times 7 & \times 7 & \times 7 \\ \hline \end{array}$$

$$\begin{array}{rrrrrrrrrr} 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 \\ \times 5 & \times 0 & \times 2 & \times 6 & \times 1 & \times 9 & \times 3 & \times 8 & \times 4 & \times 7 \\ \hline \end{array}$$

Here are the division facts for 7:

$$\begin{array}{rrrrrrrrrr} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 7\overline{)0} & 7\overline{)7} & 7\overline{)14} & 7\overline{)21} & 7\overline{)28} & 7\overline{)35} & 7\overline{)42} & 7\overline{)49} & 7\overline{)56} & 7\overline{)63} \end{array}$$

If you know the 7 table, cover it and divide. Then check your answers by multiplying the divisor with the quotient.

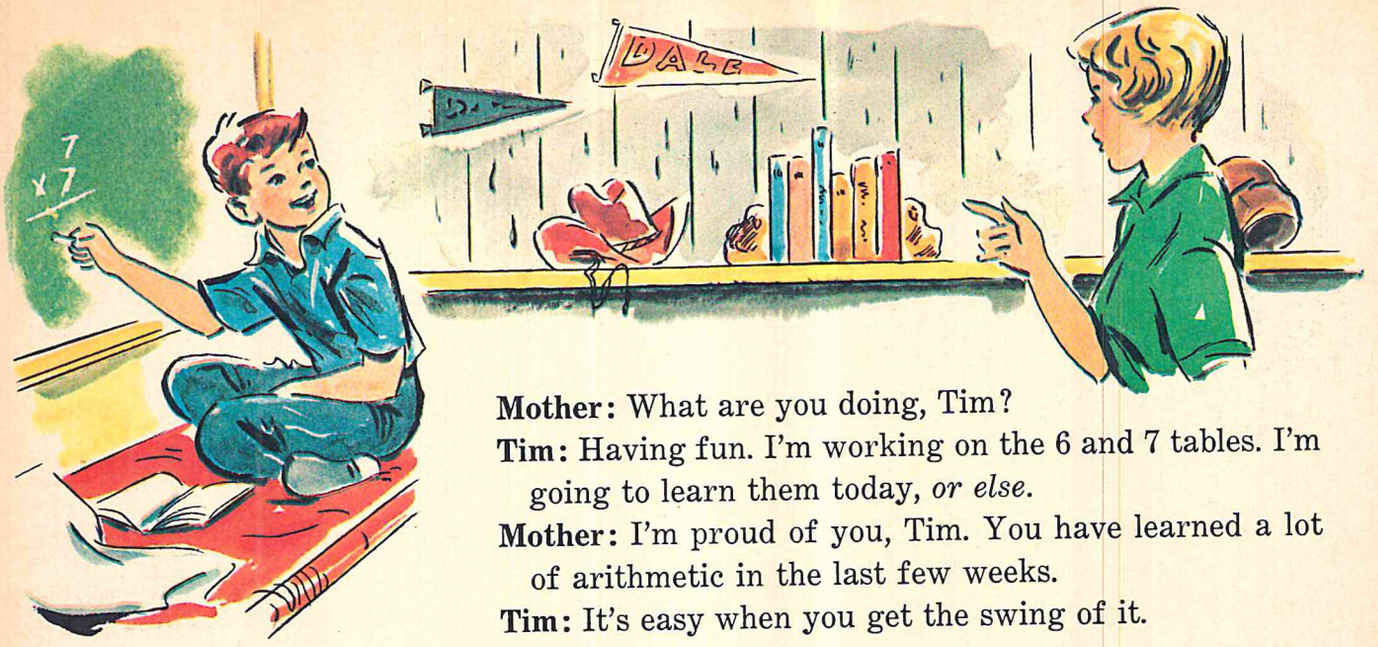
$$\begin{array}{rrrrrrrrrr} 7\overline{)21} & 7\overline{)49} & 7\overline{)63} & 7\overline{)0} & 7\overline{)7} & 7\overline{)56} & 7\overline{)14} & 7\overline{)28} & 7\overline{)35} & 7\overline{)42} \end{array}$$

There are 7 days in a week. Tim sleeps 63 hours in a week. How many hours does he sleep each night? _____

Six children gave reports. This took 30 minutes. How many minutes for each report? _____

Check these answers with page 22.

Answers to problems on page 12: Row A—75, 141, 107, 125, 122, 114, 65, 102, 134, 132 Row B—$1.61, $3.52, $4.63, $6.40, $5.91, $10.35, $4.14 Row C—20, 18, 22, 17, 13, 17, 11, 17, 19, 12, 22, 19




**Mother:** What are you doing, Tim?

**Tim:** Having fun. I'm working on the 6 and 7 tables. I'm going to learn them today, *or else*.

**Mother:** I'm proud of you, Tim. You have learned a lot of arithmetic in the last few weeks.

**Tim:** It's easy when you get the swing of it.

Do *you* know the 6 and 7 tables? Try these:

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 ×6 | 2 ×6 | 0 ×7 | 3 ×7 | 5 ×7 | 4 ×6 | 4 ×7 | 1 ×7 | 3 ×6 | 6 ×7 | 7 ×6 | 9 ×7 |
| 5 ×6 | 8 ×6 | 1 ×6 | 2 ×7 | 7 ×7 | 9 ×6 | 6 ×6 | 8 ×7 | 6 ×2 | 7 ×0 | 6 ×4 | 6 ×5 |
| 7 ×9 | 7 ×8 | 6 ×9 | 6 ×3 | 6 ×0 | 7 ×3 | 7 ×5 | 7 ×4 | 7 ×1 | 6 ×1 | 6 ×8 | 7 ×2 |

More practice with division—try it.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $6\overline{)54}$ | $7\overline{)56}$ | $7\overline{)63}$ | $6\overline{)0}$ | $6\overline{)30}$ | $7\overline{)42}$ | $6\overline{)18}$ | $7\overline{)0}$ | $6\overline{)6}$ | $7\overline{)14}$ |
| $7\overline{)7}$ | $6\overline{)12}$ | $6\overline{)48}$ | $7\overline{)49}$ | $7\overline{)21}$ | $6\overline{)36}$ | $7\overline{)35}$ | $6\overline{)42}$ | $6\overline{)24}$ | $7\overline{)28}$ |

Review the 2, 3, 4, 5, 6, and 7 tables.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 ×2 | 4 ×5 | 6 ×3 | 8 ×7 | 7 ×4 | 9 ×6 | 5 ×0 | 2 ×1 | 7 ×7 | 6 ×4 | 9 ×3 | 7 ×5 |
| 6 ×6 | 4 ×3 | 5 ×2 | 5 ×5 | 0 ×4 | 3 ×7 | 3 ×3 | 4 ×2 | 8 ×6 | 4 ×4 | 7 ×1 | 5 ×6 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $6\overline{)24}$ | $5\overline{)30}$ | $3\overline{)9}$ | $2\overline{)12}$ | $5\overline{)10}$ | $7\overline{)49}$ | $4\overline{)16}$ | $0\overline{)7}$ | $3\overline{)15}$ | $4\overline{)36}$ |

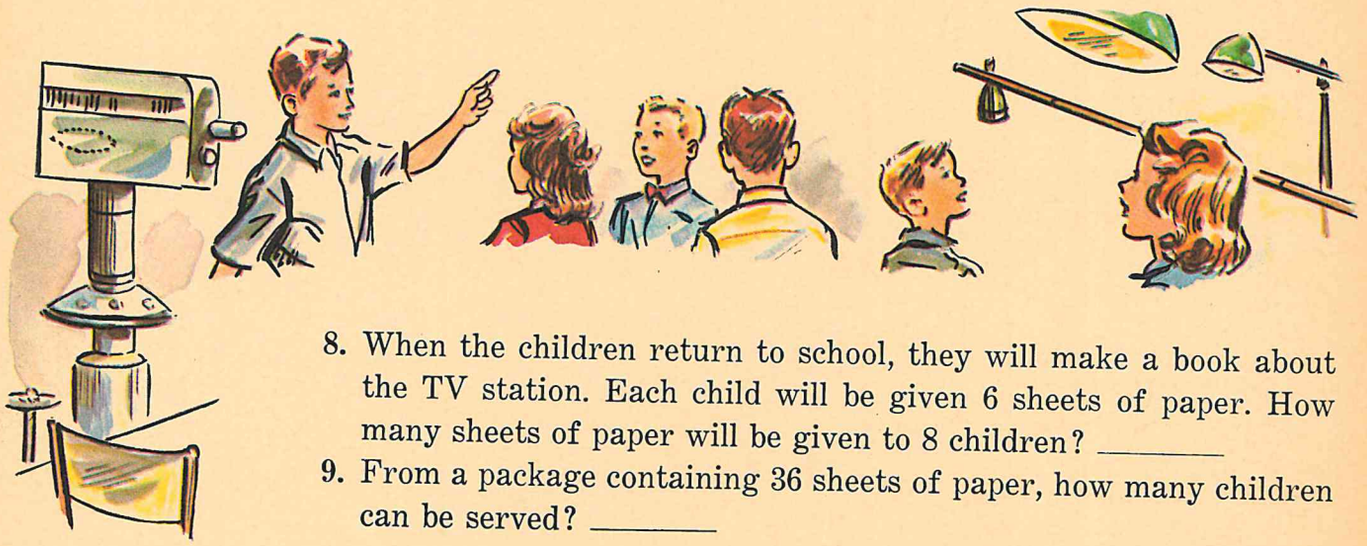
Answers to problems on page 21: 9 hours each night. Each report 5 min.

Answers to problems on page 14: 19, 37, 17, 29, 27, 7, 55, 14, 29, 43

**Tim:** I can't wait until tomorrow.
**Father:** What's going to happen tomorrow?
**Tim:** Don't you remember? Our class is going to visit a TV station. Mother is going to drive some of us.
**Father:** That's right. And she asked me to check the gas and oil.
**Tim:** Yes! We don't want to be late getting there.
**Father:** I'll hear all about it tomorrow night.
**Tim:** There's a lot of planning for a thing like this. Our teacher is letting us do some of the planning.

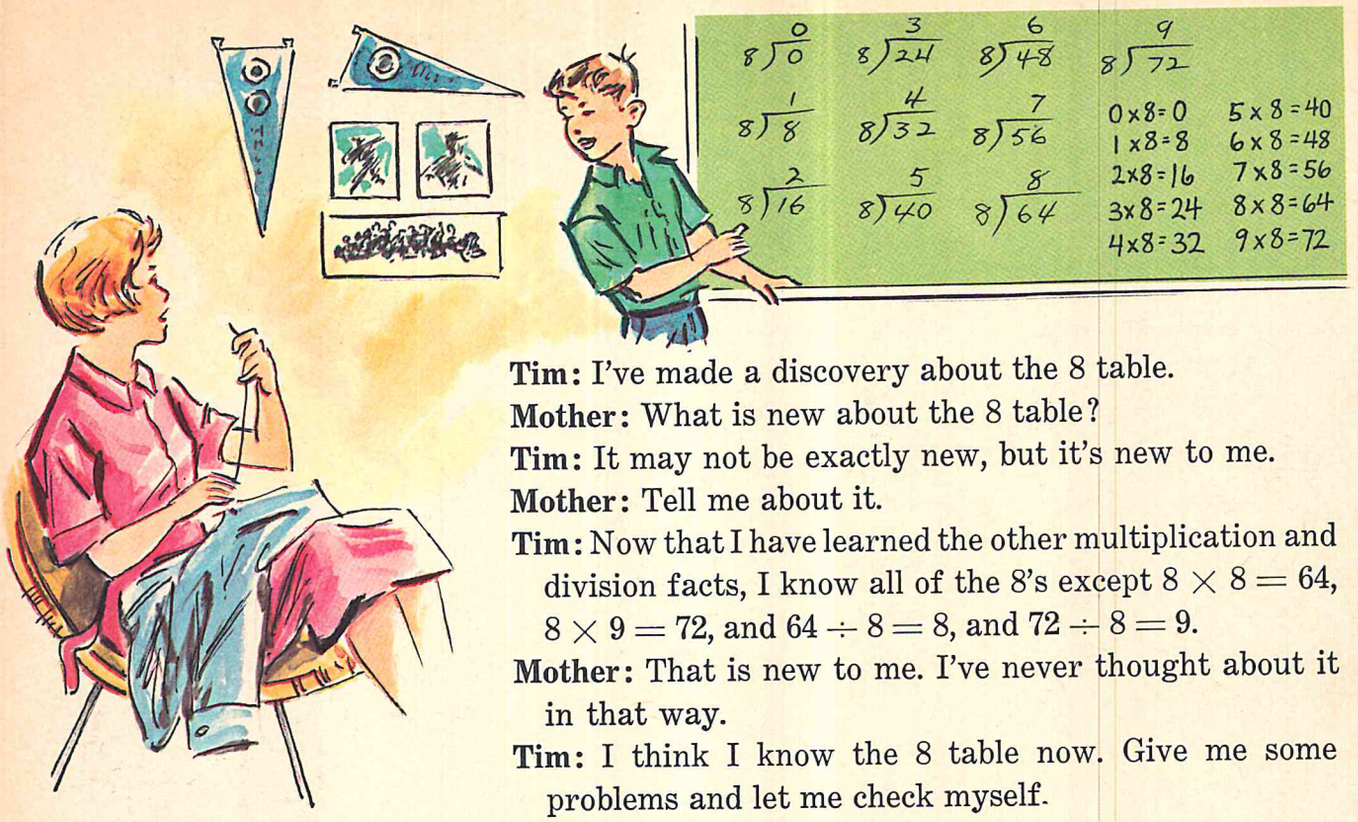
**Can you solve some of Tim's problems?**

1. There are 30 children in Tim's class. Six mothers will drive. How many children will ride in each car? _____
2. The station is 7 miles from school. How far will each car travel to the station and back to school? _____
3. If each car travels 7 miles to the station, what is the total miles the 6 cars will travel? _____
4. The teacher will drive her own car and meet the group at the TV station. There will be 7 cars on the return trip to school. How many miles will all the cars travel on the return trip? _____
5. They will be at the station 54 minutes. They will visit 6 departments. If they spend an equal time in each department, how long will they stay in each? _____
6. Three performers will give autographed pictures to each child. What will be the total number of pictures given to 6 children? _____
7. What will be the total number of pictures given to 7 children? _____



8. When the children return to school, they will make a book about the TV station. Each child will be given 6 sheets of paper. How many sheets of paper will be given to 8 children? _____
9. From a package containing 36 sheets of paper, how many children can be served? _____

Solve the problems, then check your answers with page 24.




**Tim:** I've made a discovery about the 8 table.

**Mother:** What is new about the 8 table?

**Tim:** It may not be exactly new, but it's new to me.

**Mother:** Tell me about it.

**Tim:** Now that I have learned the other multiplication and division facts, I know all of the 8's except $8 \times 8 = 64$, $8 \times 9 = 72$, and $64 \div 8 = 8$, and $72 \div 8 = 9$.

**Mother:** That is new to me. I've never thought about it in that way.

**Tim:** I think I know the 8 table now. Give me some problems and let me check myself.

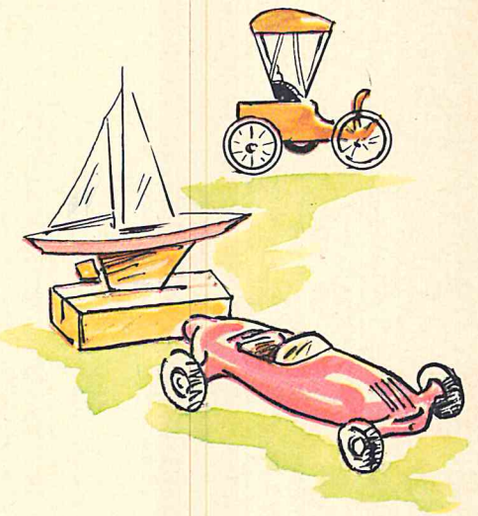
Why don't you do what Tim did?

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 3 | 7 | 9 | 1 | 2 | 6 | 4 | 8 | 5 | 8 | 8 |
| ×8 | ×8 | ×8 | ×8 | ×8 | ×8 | ×8 | ×8 | ×8 | ×8 | ×4 | ×0 |
| 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 9 | 6 | 5 | 3 |
| ×7 | ×3 | ×6 | ×9 | ×5 | ×2 | ×1 | ×8 | ×8 | ×8 | ×8 | ×8 |
| $8\overline{)64}$ | $8\overline{)32}$ | $8\overline{)8}$ | $8\overline{)40}$ | $8\overline{)72}$ | $8\overline{)56}$ | $8\overline{)48}$ | $8\overline{)16}$ | $8\overline{)24}$ | $8\overline{)0}$ | | |

Check these answers with page 78.

There are 8 boys in Tim's Hobby Club. Each boy has shown 3 hobby exhibits. How many exhibits were there in all? _____

All 8 boys have attended 6 meetings. The secretary places an x beside the names of those present when roll is called at each meeting. How many x's are on the sheet? _____



Check the answers with page 26.

Answers to problems on page 23: (1) 5, (2) 14, (3) 42, (4) 49, (5) 9, (6) 18, (7) 21, (8) 48, (9) 6

**Tim:** Hi, Bill! Going to the party?
**Bill:** You bet! I wouldn't miss it.
**Tim:** I hear we are going to square dance.
**Bill:** Good! I like square dancing.
**Tim:** So do I since I learned how to do it.
**Bill:** My Dad is always saying, "We like to do the things we can do well."
**Tim:** That's true, my boy! Including arithmetic.

1. If 12 girls and 12 boys go to the party, how many children will be there? _____
2. With 8 children dancing in each set, how many sets will there be? _____
3. With 8 children in each set, how many will there be in 2 sets? _____
4. If each dance takes 8 minutes, how many minutes will one child dance if he dances 7 times? _____
5. How many minutes will a child dance if he dances 6 times? _____
6. The hostess plans 24 glasses of punch for each set of 8 children. How many glasses for each child? _____
7. There are 8 albums of records with 6 different songs in each. How many songs altogether? _____

Solve these problems. Then check the answers with page 27.

More practice with 6, 7, and 8:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $6\overline{)54}$ | $7\overline{)21}$ | $7\overline{)56}$ | $6\overline{)18}$ | $8\overline{)32}$ | $8\overline{)16}$ | $6\overline{)42}$ | $8\overline{)64}$ | $7\overline{)49}$ | $8\overline{)48}$ |
| $6\overline{)24}$ | $7\overline{)42}$ | $8\overline{)72}$ | $6\overline{)12}$ | $8\overline{)56}$ | $7\overline{)7}$ | $6\overline{)48}$ | $7\overline{)0}$ | $8\overline{)8}$ | $6\overline{)36}$ |
| $7\overline{)63}$ | $6\overline{)6}$ | $7\overline{)14}$ | $8\overline{)0}$ | $8\overline{)24}$ | $6\overline{)0}$ | $7\overline{)35}$ | $8\overline{)40}$ | $6\overline{)30}$ | $7\overline{)28}$ |

Check your answers by multiplying. Then check with page 78.

**Tim:** I learned something new today.
**Mother:** Good! What did you learn?
**Tim:** We call them tricks with 9. Really, it is just an easy way to help us to remember the 9 table.
**Mother:** Can you show me, Tim?
**Tim:** Yes, and I'll bet you'll like the trick, too.

$0 \times 9 = 0$
$1 \times 9 = 9$
$2 \times 9 = 18$.....$1 + 8 = 9$
$3 \times 9 = 27$.....$2 + 7 = 9$
$4 \times 9 = 36$.....$3 + 6 = 9$
$5 \times 9 = 45$.....$4 + 5 = 9$
$6 \times 9 = 54$.....$5 + 4 = 9$
$7 \times 9 = 63$.....$6 + 3 = 9$
$8 \times 9 = 72$.....$7 + 2 = 9$
$9 \times 9 = 81$.....$8 + 1 = 9$

The sum of the two figures in the answer equals 9.

Look at the 9 table again. The first figure in the answer is always *one less* than the multiplier.

Suppose you multiply $3 \times 9 = 27$.
$3 - 1 = 2$. The first figure in your answer will be 2.
Now, 2 plus ? $= 9$. $2 + 7 = 9$. The answer is 27.

Suppose you multiply $6 \times 9$
$6 - 1 = 5$. The first figure in the answer will be 5.
$5 + ? = 9$. $5 + 4 = 9$. The answer is 54.

Perhaps you can figure out tricks to help you learn division facts of 9, too.

Cover the 9 table, then write the answers to these:

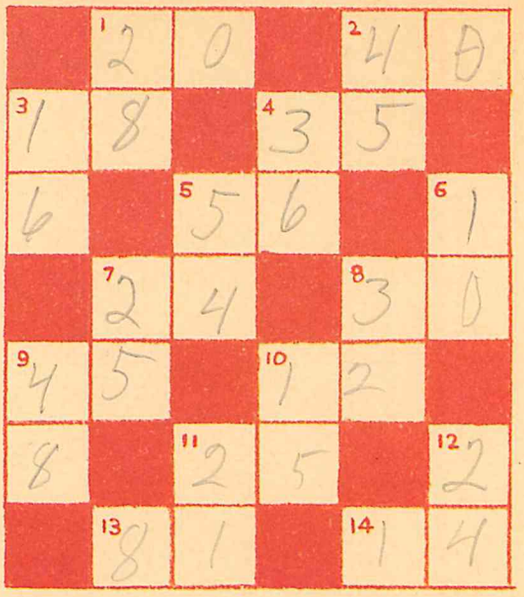
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| $\times 1$ | $\times 7$ | $\times 0$ | $\times 8$ | $\times 2$ | $\times 6$ | $\times 3$ | $\times 9$ | $\times 4$ | $\times 5$ |
| | | | | | | | | | |
| $9/\overline{81}$ | $9/\overline{45}$ | $9/\overline{9}$ | $9/\overline{36}$ | $9/\overline{54}$ | $9/\overline{72}$ | $9/\overline{18}$ | $9/\overline{63}$ | | |

Answers for page 24: 24 exhibits, 48 x marks

## MORE PUZZLES FROM TIM'S NUMBER-PUZZLE BOOK

ACROSS

1. $5 \times 4 =$ 20
2. $8 \times 5 =$ 40
3. $2 \times 9 =$ 18
4. $5 \times 7 =$ 35
5. $8 \times 7 =$ 56
7. $4 \times 6 =$ 24
8. $6 \times 5 =$ 30
9. $5 \times 9 =$ 45
10. $2 \times 6 =$ 12
11. $5 \times 5 =$ 25
13. $9 \times 9 =$ 81
14. $7 \times 2 =$ 14



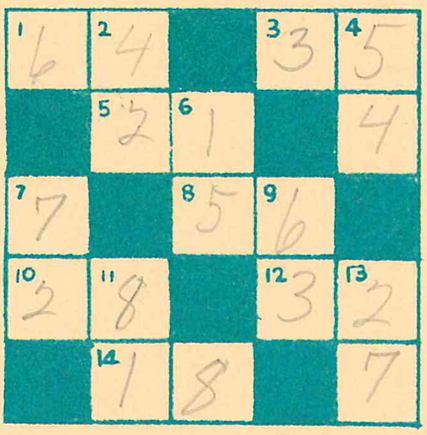
DOWN

1. $7 \times 4 =$ 28
2. $5 \times 9 =$ 45
3. $4 \times 4 =$ 16
4. $6 \times 6 =$ 36
5. $9 \times 6 =$ 54
6. $2 \times 5 =$ 10
7. $5 \times 5 =$ 25
8. $4 \times 8 =$ 32
9. $6 \times 8 =$ 48
10. $5 \times 3 =$ 15
11. $7 \times 3 =$ 21
12. $3 \times 8 =$ 24

---

ACROSS

1. $8 \times 8 =$ 64
3. $7 \times 5 =$ 35
5. $3 \times 7 =$ 21
8. $8 \times 7 =$ 56
10. $7 \times 4 =$ 28
12. $4 \times 8 =$ 32
14. $6 \times 3 =$ 18



DOWN

2. $7 \times 6 =$ 42
4. $6 \times 9 =$ 54
6. $3 \times 5 =$ 15
7. $8 \times 9 =$ 72
9. $7 \times 9 =$ 63
11. $9 \times 9 =$ 81
13. $3 \times 9 =$ 27

Check the puzzle answers with page 28.

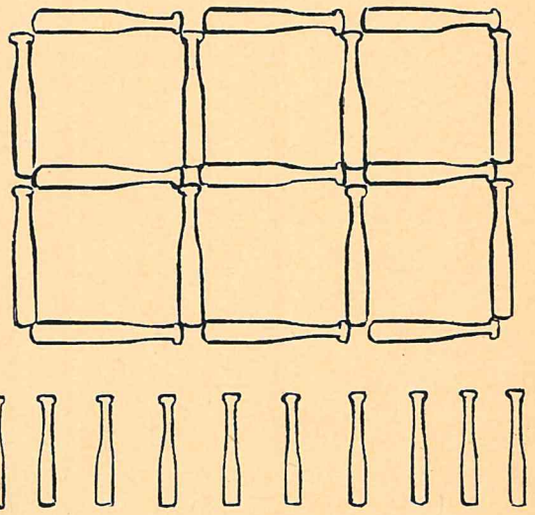
Do you like to do tricks? Try these.

17 baseball bats are arranged to make 6 squares, as shown in the picture. Can you remove 6 bats and leave 2 squares?

Can you remove 5 bats and leave 3 squares?

By moving these 10 baseball bats to another position, you can change them into a 5. Try it.

Look at page 28 for the solution of these tricks.



Answers to problems on page 25: (1) 24, (2) 3, (3) 16, (4) 56, (5) 48, (6) 3, (7) 48

**Tim:** I wish we could go to visit Aunt Sue today.
**Mother:** I don't have the car. But you may go on the bus.
**Tim:** That would be fun. I've never gone alone.
**Mother:** You will need to use some arithmetic on the trip.
**Tim:** That's okay. I like arithmetic now.

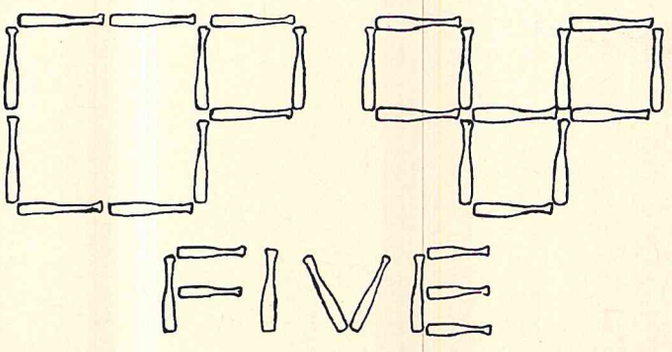
Will Tim *add*, *subtract*, *multiply*, or *divide* in the following problems? Circle the correct process. Then write the answer.

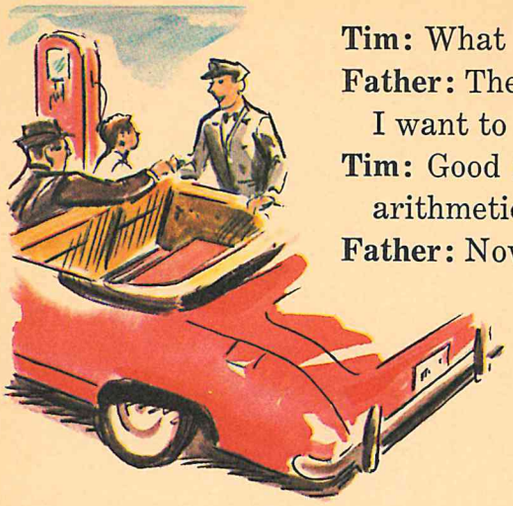
1. Tim's aunt lives 5 miles from his house. His grandmother lives 1 mile from him. How much farther is it to his aunt's house than to his grandmother's? _____ Did you add, subtract, multiply, or divide?
2. The bus fare to his aunt's house is 12¢ one way. How much will the round trip cost? _____ Did you add, subtract, multiply, or divide?
3. Tim had 2 girls and 1 boy to play with at his aunt's house. Including Tim, how many children played together? _____ Did you add, subtract, multiply, or divide?
4. Tim's aunt gave them 40¢ to spend at the store. Each of the 4 children had an equal amount. How much did Tim have? _____ Did you add, subtract, multiply, or divide?
5. Tim played a game with his cousin Marty. Tim's score was 32. Marty's score was 36. How many more points did Marty have than Tim? _____ Did you add, subtract, multiply, or divide?
6. Tim played ball 1 hour. Marty played twice as long. How long did Marty play? _____ Did you add, subtract, multiply, or divide?
7. The bus ride to his aunt's house took 30 minutes. Because of traffic, the trip home took 45 minutes. How much longer was the trip home? _____ Did you add, subtract, multiply, or divide?

Check your answers with page 30.

| | | | | | |
|---|---|---|---|---|---|
| | 2 | 0 | | 4 | 0 |
| 1 | 8 | | 3 | 5 | |
| 6 | | 5 | 6 | | 1 |
| | 2 | 4 | | 3 | 0 |
| 4 | 5 | | 1 | 2 | |
| 8 | | 2 | 5 | | 2 |
| | 8 | 1 | | 1 | 4 |

| | | | | |
|---|---|---|---|---|
| 6 | 4 | | 3 | 5 |
| | 2 | 1 | | 4 |
| 7 | | 5 | 6 | |
| 2 | 8 | | 3 | 2 |
| | 1 | 8 | | 7 |





**Tim:** What are they doing to your car, Dad?

**Father:** They are checking everything. I'm going on a trip tomorrow. I want to be sure it is all right.

**Tim:** Good idea! I think I'll check up on the things I've learned in arithmetic lately, before I start anything new.

**Father:** Now you are using your head, Son.

LET US
CHECK YOUR CAR
REGULARLY

| hundreds | tens | ones |
|---|---|---|
| | | |
| | | |
| | | |

Put marks in this frame for the following numbers: 321, 406, 782, 141

Review addition.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 41 +35 | 82 +15 | 74 +23 | 80 +50 | 39 +21 | 64 +78 | 78 +65 | 47 +28 |
| 321 +415 | 672 +324 | 503 +275 | 412 +636 | 724 +863 | 482 +345 | 506 +379 | 678 +234 | 250 +369 | 728 +483 |
| 3 7 +8 | 4 5 +2 | 6 7 +9 | 5 3 +0 | 7 1 +4 | 2 4 +6 | 1 2 +5 | 9 6 +1 | 5 4 +7 | 8 3 +5 | 7 0 +9 | 6 2 +8 |

Review subtraction.

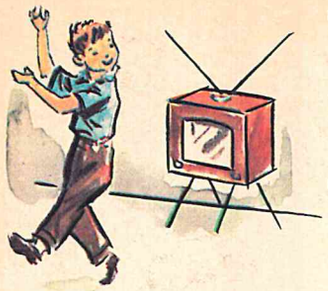
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 39 −21 | 54 −23 | 34 −26 | 50 −25 | 83 −64 | 17 −9 | 40 −38 | 95 −67 |
| 263 −141 | 875 −623 | 789 −342 | 654 −230 | 546 −425 | 623 −414 | 506 −342 | 824 −585 | 400 −273 | 721 −634 |

Review multiplication.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 ×6 | 8 ×7 | 9 ×3 | 7 ×0 | 6 ×6 | 5 ×9 | 6 ×4 | 8 ×6 | 7 ×7 |
| 0 ×5 | 2 ×4 | 7 ×8 | 5 ×7 | 8 ×5 | 6 ×7 | 9 ×6 | 4 ×9 | 8 ×9 | 5 ×8 | 8 ×4 | 7 ×5 |

Review division. $9\overline{)81}$ $5\overline{)20}$ $7\overline{)42}$ $4\overline{)36}$ $6\overline{)0}$ $3\overline{)24}$

Check subtraction problems by adding.
Check multiplication and division with pages 78 and 79.
Check answers to addition problems with page 30.



**Tim:** Whoopee! It's Saturday. My day to watch TV. Last week I got the time mixed up and missed the cartoons.

**Mother:** Why not make a list of the programs you want to see. Put down the time for each one. You won't miss any of them that way.

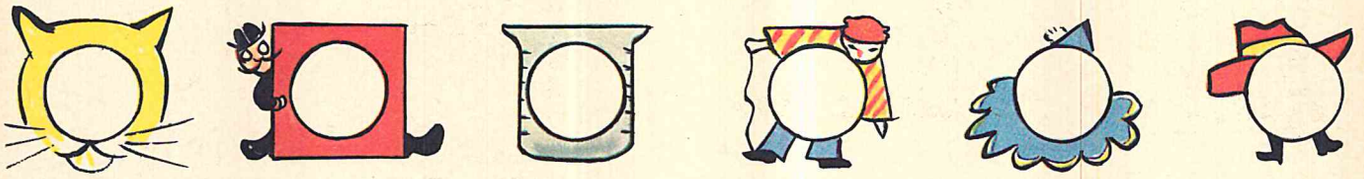
**Tim:** Good idea! You are a pal, Mom.

Make a schedule for the programs you want to see.

Write the time the programs can be seen on *your* TV.

Cartoons _____
Comedy _____
Science _____
Puppet Show _____
Circus _____
Western _____

Mark the time you can see each of these programs.



Cartoon Comedy Science Puppet Show Circus Western

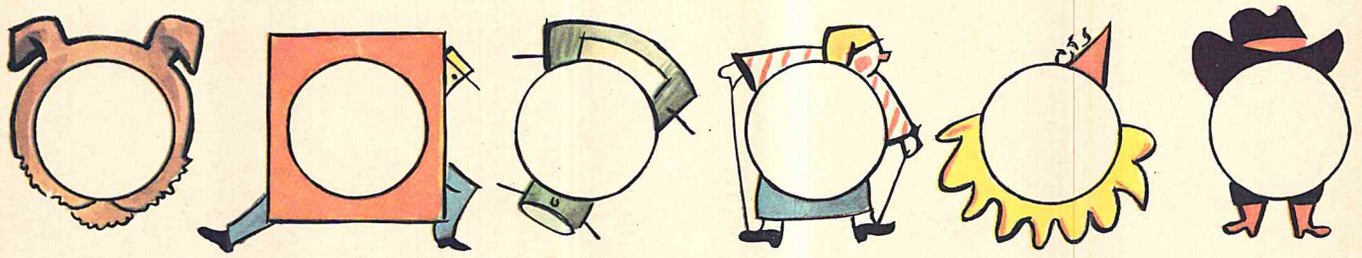
Do you know that A.M. means *before noon?*
Do you know that P.M. means *afternoon?*

Look at the schedule you made for your TV programs. Write A.M. *or* P.M. after the time for each.

If you turn on the TV five minutes before each program, what time will you turn it on for the following programs?

Cartoon _____
Comedy _____
Science _____
Puppet Show _____
Circus _____
Western _____

Mark the time on each clock to show when you will turn on the TV.



Cartoon Comedy Science Puppet Show Circus Western

Answers for page 28: (1) 4 subtract, (2) 24¢ multiply, (3) 4 add, (4) 10¢ divide, (5) 4 subtract, (6) 2 multiply, (7) 15 subtract

Answers to addition problems on page 29: 76, 97, 97, 130, 60, 142, 143, 75, 736, 996, 778, 1048, 1587, 827, 885, 912, 619, 1211, 18, 11, 22, 8, 12, 12, 8, 16, 16, 16, 16, 16

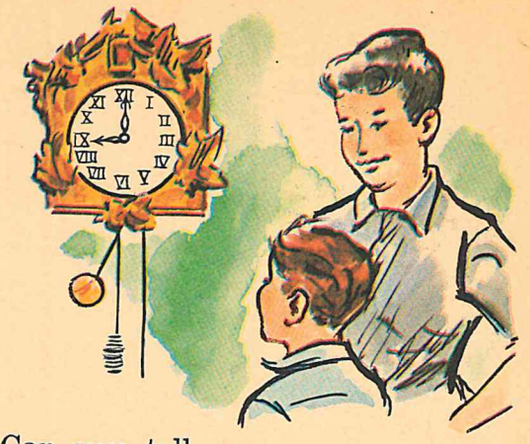
**Tim:** Have you had this clock a long time, Grandmother?

**Grandmother:** Yes, a very long time.

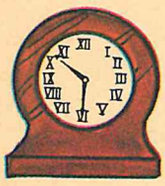
**Tim:** The numbers are different from numbers on most clocks, aren't they?

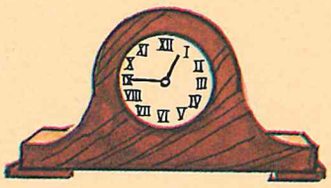
**Grandmother:** This cuckoo clock has Roman numbers, Tim. Most clocks have Arabic numbers.

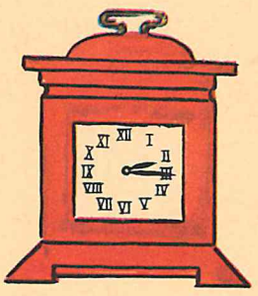
**Tim:** That's interesting. I can tell the time even with Roman numbers.



These clocks are like Grandmother's cuckoo clock. Can you tell what time each one says?







Some of the Roman numbers are:

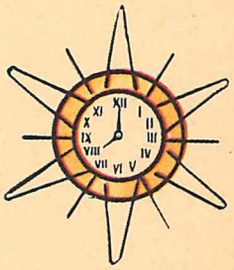
I = 1 V = 5 X = 10 L = 50 C = 100

Roman numbers are easy to read.

2 = II, or 1 + 1
3 = III, or 1 + 1 + 1
4 = IV, or 5 − 1
6 = VI, or 5 + 1
7 = VII, or 5 + 2
8 = VIII, or 5 + 3
9 = IX, or 10 − 1

Write Roman numbers for these:

1 _____ 6 _____
4 _____ 2 _____
7 _____ 5 _____
8 _____ 3 _____
10 _____ 9 _____



Look at these Roman numbers, then write an Arabic number after each:

X ___ V ___ III ___ VI ___ IX ___ IV ___ VII ___ II ___

Roman numbers are usually called Roman *numerals*.
I or X written *at the left* of a Roman numeral means subtract.
I, V, X, or L *after* a Roman numeral means add.

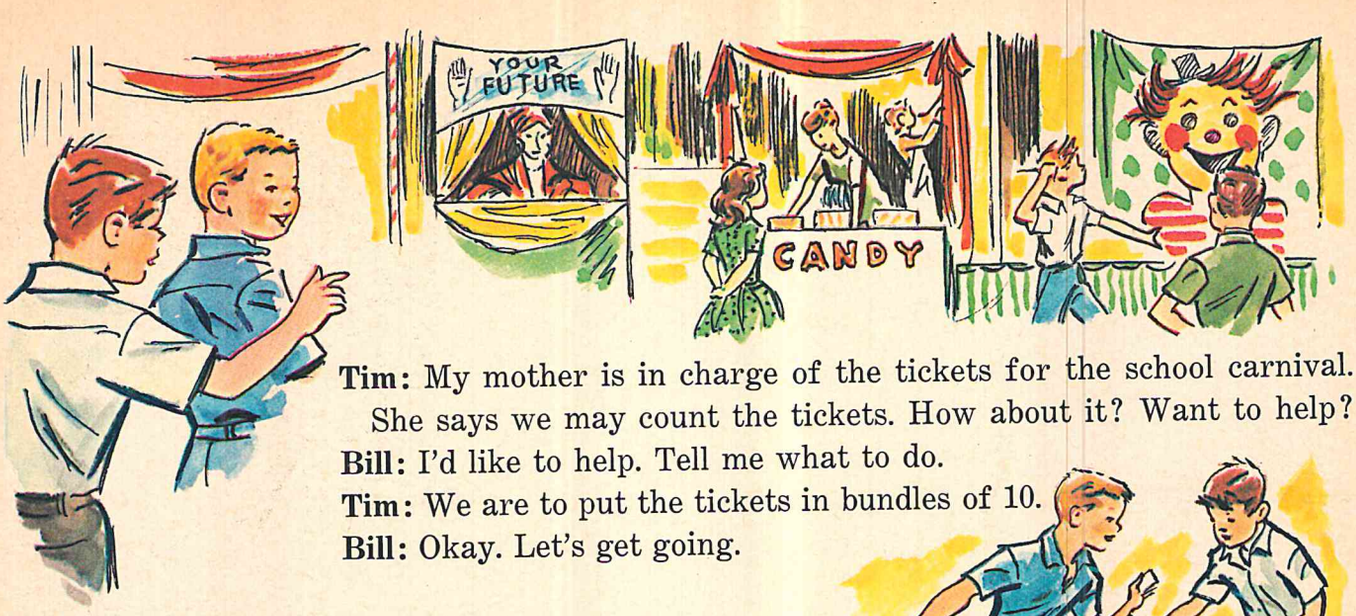
14 is XIV, or 10 + 4
19 is XIX, or 10 + 9
40 is XL, or 50 − 10
90 is XC, or 100 − 10

Write Arabic numbers for the Roman numerals:

X ___ V ___ III ___ XX ___ VIII ___ XI ___

XL ___ I ___ XIX ___ XIV ___ XV ___ C ___

Check these last two rows with page 32.




**Tim:** My mother is in charge of the tickets for the school carnival. She says we may count the tickets. How about it? Want to help?
**Bill:** I'd like to help. Tell me what to do.
**Tim:** We are to put the tickets in bundles of 10.
**Bill:** Okay. Let's get going.

**Tim:** We have 5 bundles here. That is $10 + 10 + 10 + 10 + 10 = 50$.
**Bill:** There is an easier way, Tim.
**Tim:** How? Tell me.
**Bill:** Just multiply. $10 \times 5 = 50$.

1 ten and 0 ones
×5
5 tens and 0 ones or 50

$$\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$$

**Tim:** That looks easy. Let's count out some more.
**Bill:** Here are 8 bundles with 10 tickets each.
**Tim:** That's $10 \times 8 = 80$.

1 ten and 0 ones
×8
8 tens and 0 ones or 80

$$\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array}$$

**Bill:** You catch on fast, Tim.
**Tim:** Let's pretend we have 20 tickets in each bundle. How many tickets would be in 3 bundles?

2 tens and 0 ones
×3
6 tens and 0 ones or 60

$$\begin{array}{r} 20 \\ \times 3 \\ \hline 60 \end{array}$$

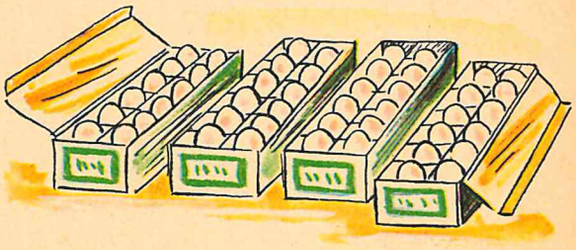
Let's practice multiplying tens.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 30 ×2 | 20 ×4 | 40 ×3 | 60 ×6 | 50 ×8 | 10 ×5 | 70 ×1 | 90 ×7 | 80 ×3 | 60 ×5 |
| 10 ×4 | 50 ×6 | 60 ×2 | 30 ×8 | 20 ×5 | 90 ×3 | 40 ×9 | 70 ×7 | 30 ×1 | 80 ×4 |

Arabic numbers for page 31: 10, 5, 3, 20, 8, 11, 40, 1, 19, 14, 15, 100

**Bill:** Are you doing anything today, Tim?
**Tim:** Nothing special, why?
**Bill:** Want to go with us to my uncle's chicken farm?
**Tim:** Oh, boy! You bet I do. When do we start?
**Bill:** We will pick you up in 45 minutes.
**Tim:** It's 2:15 now. See you at 3 o'clock?
**Bill:** Right!

**Bill:** There are 12 eggs in each carton.
**Tim:** Then in 4 cartons there would be 12 + 12 + 12 + 12. That's 48.
**Bill:** That's the slow way. You multiply like we did when we counted the tickets.
**Tim:** Why didn't I think of that?



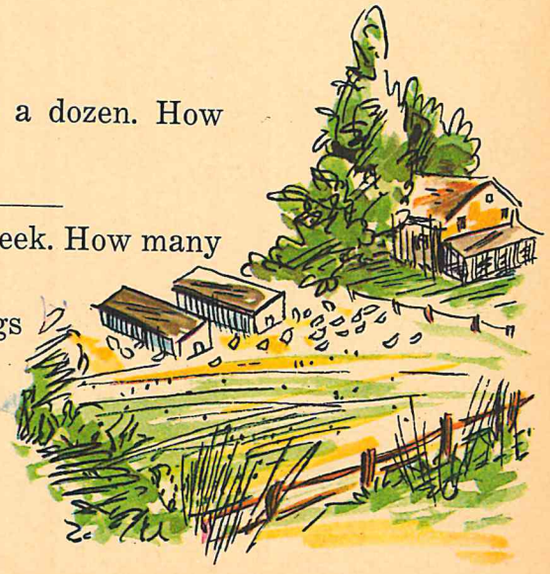
| 1 ten and 2 ones | 12 |
|---|---|
| ×4 | ×4 |
| 4 tens and 8 ones | 48 |

**Tim:** Do you multiply all two-place numbers like that?
**Bill:** You catch on fast, pal.

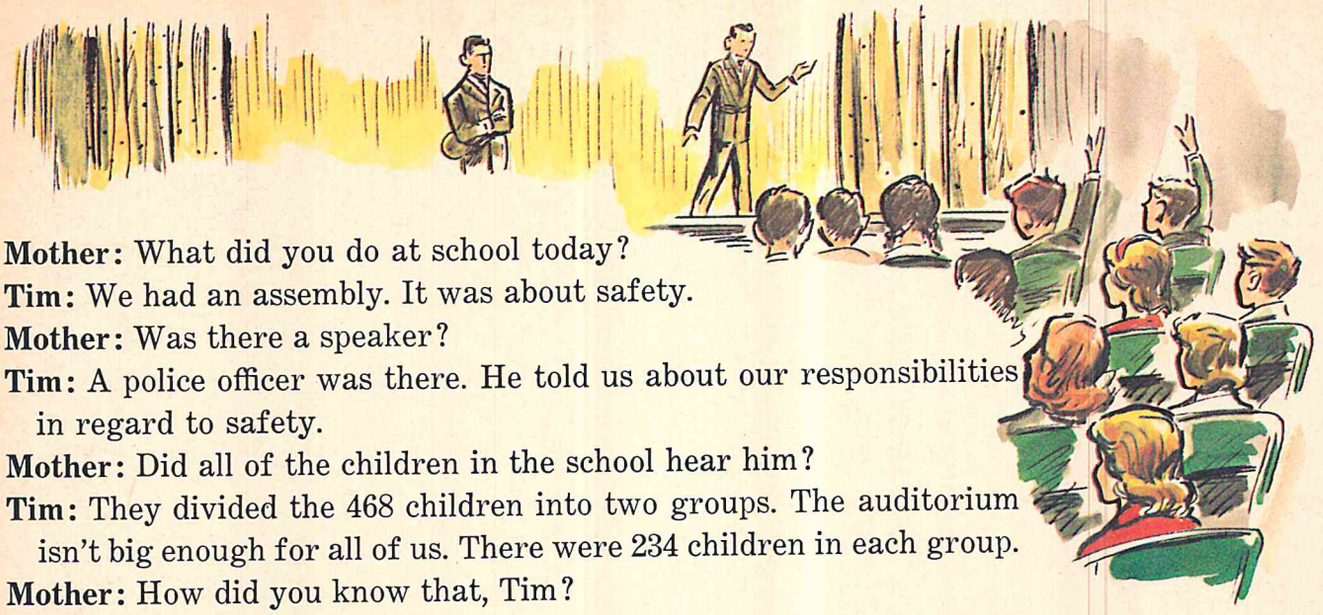
Can *you* multiply these? Check your answers by adding.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 ×3 | 11 ×6 | 13 ×3 | 14 ×2 | 21 ×7 | 23 ×2 | 34 ×2 | 41 ×8 | 32 ×4 | 43 ×2 | 52 ×3 |
| 74 ×2 | 53 ×3 | 71 ×2 | 62 ×3 | 42 ×3 | 31 ×5 | 64 ×2 | 83 ×3 | 92 ×3 | 73 ×3 | 63 ×3 |

1. Tim's mother bought 3 dozen eggs. She paid 53¢ a dozen. How much did she pay for 3 dozen? _____
2. How much would 2 dozen cost at 53¢ a dozen? _____
3. Bill's uncle said that 41 hens laid 5 eggs, each, last week. How many eggs did the 41 hens lay last week? _____
4. If 50 hens laid 6 eggs each, in a week, how many eggs did they lay? _____



Check your answers with page 34.



**Mother:** What did you do at school today?
**Tim:** We had an assembly. It was about safety.
**Mother:** Was there a speaker?
**Tim:** A police officer was there. He told us about our responsibilities in regard to safety.
**Mother:** Did all of the children in the school hear him?
**Tim:** They divided the 468 children into two groups. The auditorium isn't big enough for all of us. There were 234 children in each group.
**Mother:** How did you know that, Tim?
**Tim:** I divided 468 by 2. And when we got back to our room, our teacher showed us how to multiply in hundreds. I know that $234 \times 2 = 468$.

Can *you* multiply three-place numbers?

Multiply the ones first, then the tens, then the hundreds.

2 hundreds 3 tens 4 ones
$\times 2$
4 hundreds 6 tens 8 ones $= 468$

$$\begin{array}{r} 234 \\ \times 2 \\ \hline 468 \end{array}$$

Tim multiplied this way. Check his answers. Are they correct?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 132 | 221 | 244 | 210 | 323 | 401 | 331 | 213 | 243 | 212 |
| $\times 3$ | $\times 3$ | $\times 2$ | $\times 4$ | $\times 3$ | $\times 2$ | $\times 3$ | $\times 2$ | $\times 2$ | $\times 4$ |
| 396 | 663 | 488 | 840 | 969 | 802 | 993 | 426 | 486 | 848 |

Now *you* try these:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 424 | 444 | 334 | 311 | 120 | 321 | 221 | 331 | 223 |
| $\times 2$ | $\times 2$ | $\times 2$ | $\times 3$ | $\times 4$ | $\times 3$ | $\times 4$ | $\times 3$ | $\times 3$ |
| 234 | 333 | 222 | 102 | 320 | 200 | 420 | 314 | 301 |
| $\times 2$ | $\times 3$ | $\times 4$ | $\times 4$ | $\times 3$ | $\times 4$ | $\times 2$ | $\times 2$ | $\times 3$ |
| \$1.24 | \$2.32 | \$3.00 | \$1.34 | \$2.10 | \$4.30 | \$3.02 | | |
| $\times 2$ | $\times 2$ | $\times 5$ | $\times 2$ | $\times 5$ | $\times 3$ | $\times 3$ | | |

Check the answers with page 37.

| | | | | |
|---|---|---|---|---|
| 3 | 2 | 1 | | |
| | 2 | 5 | 6 | |
| 8 | | 3 | 4 | |

| | | | | |
|---|---|---|---|---|
| 3 | 9 | | 8 | 7 |
| | 4 | 5 | | 6 |
| 6 | | 1 | | 4 |
| 2 | 6 | | 9 | |
| 3 | | 4 | 7 | 2 |

Answers for page 33:

36, 66, 39, 28, 147, 46, 68, 328, 128, 86, 156
148, 159, 142, 186, 126, 155, 128, 249, 276, 219, 189
\$1.59, \$1.06, 205 eggs, 300 eggs

**Tim:** How many children were on your school bus this morning?

**Polly:** I got off last. "You are number 46," said the driver.

**Tim:** That is the exact number we had on our bus.

**Polly:** Do you know how to multiply 46 × 2?

**Tim:** Do you think I don't know how to multiply?

**Polly:** But this is different. It is called *carrying* in multiplication. I'll show you how.

46
×2
12 (2×6)
+80 (2×40)
92

2 × 6 ones = 12 ones
2 × 4 tens = 80 tens
12 + 80 = 92

**Polly:** There is a shorter way to do it.

46
×2
92

2 × 6 ones = 12 ones, or 1 ten and 2 ones.
Write 2 in the ones' place.
*Remember you have one ten to carry.*
2 × 4 tens = 8 tens.
8 tens and the one ten you carried = 9 tens.
The answer is 92. Get it?

**Tim:** I think so. Give me some more problems like that.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 26 | 12 | 47 | 13 | 25 | 24 | 36 | 45 | 38 | 14 |
| ×3 | ×3 | ×6 | ×2 | ×5 | ×3 | ×4 | ×2 | ×2 | ×2 | ×3 |
| 87 | 78 | | | | | | | | | |

Are the first two answers correct? Can you *carry* in multiplication?

**Mother:** Hello, Tim! Any homework tonight?

**Tim:** Yes, but I don't *have* to do it. I *asked* my teacher for some work. She gave me some multiplication problems with *carrying*.

**Mother:** My, how you have changed. Your dad and I are very happy about you, Tim.

Answers for above problems: 87, 78, 72, 94, 65, 75, 96, 72, 90, 76, 42

Here is Tim's homework. Why don't you try it?

Row A

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 25 | 19 | 23 | 56 | 33 | 59 | 48 | 23 | 32 | 57 |
| ×3 | ×2 | ×3 | ×4 | ×2 | ×4 | ×2 | ×3 | ×5 | ×9 | ×3 |

Row B

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 67 | 24 | 13 | 32 | 79 | 96 | 58 | 23 | 77 | 32 | 58 |
| ×2 | ×3 | ×8 | ×7 | ×2 | ×3 | ×3 | ×9 | ×2 | ×7 | ×2 |

Check your answers with page 45.

**Father:** Will you please bring me about a third of a glass of milk, Tim?

**Tim:** Okay! Say, Dad, are a third and a fourth and a half called fractions?

**Father:** That's right.

**Tim:** What is a fraction, anyway?

**Father:** A fraction is one part of something. It's a way of dividing.

**Tim:** I don't understand.

**Father:** Look at this quart carton of milk. Nothing has been taken out, so we call it a *whole* carton. A fraction is a part of a whole thing.

**Tim:** I understand that all right.

**Father:** If I had asked you to bring me a half carton of milk, how much milk would have been left in the carton?

**Tim:** If I gave you half, there would be a half left.

**Father:** Right! Now, how many halves in a whole carton?

**Tim:** There are two halves in a whole carton.

**Father:** Now, pour a whole glass of milk.

**Tim:** Here it is.

**Father:** Now, pour one half back into the carton.

**Tim:** All right. But what about a third and a fourth?

**Father:** Here, divide this candy bar so that you and your mother and I will each have an equal amount.

**Tim:** When there are three equal parts, is each one called a third?

**Father:** You are getting the idea. Now, see if you can get a third of a glass of milk for me.

**Tim:** Okay, Dad. You've waited long enough for it. And thanks for explaining about fractions.

**Father:** There's a lot more to fractions. But that's enough for tonight.

**When any whole is divided into equal parts, each part is a fraction of the whole amount.**

We write fractions this way: $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$

How would you write these: one half _____ one fourth _____ one third _____

**Grandmother:** Your father says you've been learning about fractions, Tim.

**Tim:** I'm just beginning. I guess there's a lot I don't know.

**Grandmother:** Into how many equal parts is this pie cut?

**Tim:** Four. Don't you call each part a quarter of a pie?

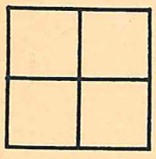
**Grandmother:** Yes, we can also call each part one fourth. You look as if you could eat this whole pie. But let's pretend you eat one fourth of it. How many fourths would be left?

**Tim:** There would be three fourths left. How do you write that? $\frac{3}{4}$

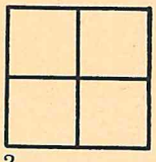
**Grandmother:** Like this, Tim.

**Tim:** Can you give me some problems using fractions?

**Grandmother:** I have a better idea. Get some crayons and you can have fun with fractions.

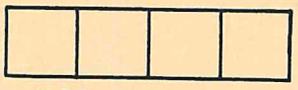


$\frac{1}{4}$ red

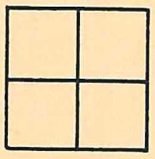


$\frac{2}{4}$ green

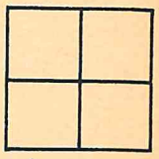
Color these the way Tim did:



$\frac{1}{2}$ blue



$\frac{3}{4}$ brown



$\frac{4}{4}$ yellow

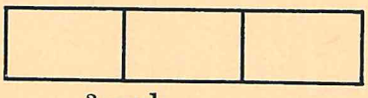
How many fourths equal one half? 2

How many fourths equal a whole? 4

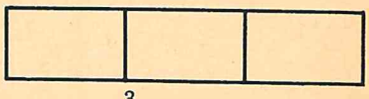
How many halves equal 4 fourths? 4

Now color these the way Tim did:

$\frac{1}{3}$ purple



$\frac{2}{3}$ red



$\frac{3}{3}$ orange

How many thirds equal a whole? _____

If you color one third and two thirds, how many thirds is that? _____

If you color two thirds, how many thirds will be left? _____

If you color one third, how many thirds will be left? _____

Which is more, one third or one fourth? _____

Which is more, one half or one fourth? _____

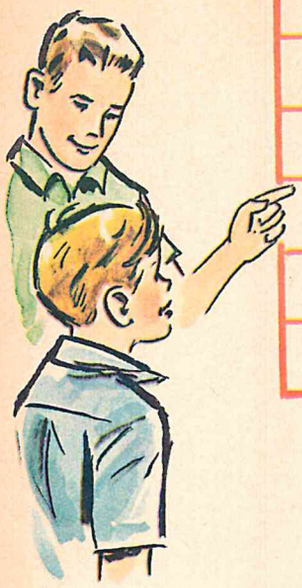
Which is more, one half or two thirds? _____

Write these in numbers:

one third _____ one half _____ two thirds _____

one fourth _____ three fourths _____ one whole _____

Answers for page 34: 848, 888, 668, 933, 480, 963, 884, 993, 669
468, 999, 888, 408, 960, 800, 840, 628, 903
$2.48, $4.64, $15.00, $2.68, $10.50, $12.90, $9.06



| FRACTION CHART | | | | | | | |
|---|---|---|---|---|---|---|---|
| One Whole | | | | | | | |
| $\frac{1}{2}$ | | | | $\frac{1}{2}$ | | | |
| $\frac{1}{3}$ | | | $\frac{1}{3}$ | | | $\frac{1}{3}$ | |
| $\frac{1}{4}$ | | $\frac{1}{4}$ | | $\frac{1}{4}$ | | $\frac{1}{4}$ | |
| $\frac{1}{6}$ | $\frac{1}{6}$ | | $\frac{1}{6}$ | | $\frac{1}{6}$ | | $\frac{1}{6}$ |
| $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ | $\frac{1}{8}$ |

**Tim:** This fraction chart you made helps a lot.
**Father:** It will give you some answers to fraction problems.
**Tim:** I didn't know before that you can divide something like a piece of candy into halves and fourths and eighths.
**Father:** Show me how you do it.

**Father:** You are doing all right, Tim. Look, I've made some problems for you. I'll check them when you finish.

1 whole = $\frac{}{2}$ 1 whole = $\frac{}{3}$ 1 whole = $\frac{}{4}$ 1 whole = $\frac{}{6}$

$\frac{1}{2} = \frac{}{4}$ $\frac{1}{2} = \frac{}{6}$ $\frac{1}{2} = \frac{}{8}$ $\frac{3}{6} = \frac{}{2}$

$\frac{1}{4} = \frac{}{8}$ $\frac{1}{3} = \frac{}{6}$ $\frac{3}{4} = \frac{}{8}$ $\frac{2}{3} = \frac{}{6}$

Write these another way—example: a whole—1.

one half _____ one fourth _____ one sixth _____ one third _____
two thirds _____ three fourths _____ one eighth _____ five sixths _____
one fifth _____ three fifths _____ seven sevenths _____ two fourths _____
one seventh _____ two sevenths _____ five eighths _____ three sixths _____

1. Tim rode his bike $\frac{3}{4}$ of a mile to play football. Bill rode $\frac{2}{3}$ of a mile to the game. Who rode farther? _____
2. Tim's father ate $\frac{1}{4}$ of a pie for lunch. His mother ate $\frac{1}{6}$ of a pie. Who ate the smaller piece? _____

Check your answers to the story problems with page 40.

Answers to problems on page 19: Row A—130, 161, 165, 118, 422, 365, 248, 455, 152, 553
Row B—213, 312, 112, 8, 27, 4, 82, 105, 215, 79

**Have fun with fractions this way:**

Draw 10 pieces of candy. Put them in 2 groups with 5 in each group.

**To find one half of a number, divide by 2.** $\frac{1}{2}$ **of 10 = 5.**

Draw 9 cookies. Put them in 3 groups with 3 in each group.

**To find one third of a number, divide by 3.** $\frac{1}{3}$ **of 9 = 3**

Draw 16 books. Put them in 4 groups with 4 in each group.

**To find one fourth of a number, divide by 4.** $\frac{1}{4}$ **of 16 = 4**

Draw 15 flying birds. Put them in groups of 5 with 3 in each group.

**To find one fifth of a number, divide by 5.** $\frac{1}{5}$ **of 15 = 3**

Draw eighteen footballs. Put them in 6 groups with 3 in each group.

**To find one sixth of a number, divide by 6.** $\frac{1}{6}$ **of 18 = 3**

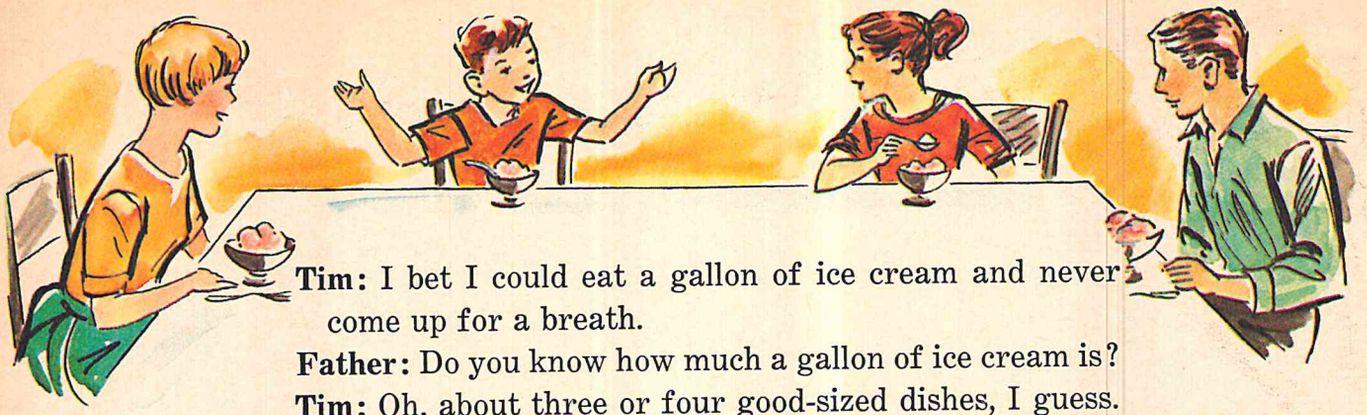
Write the answers to the following problems. Remember, you divide. Check your answers by multiplying as you did on page 14.

| | | | |
|---|---|---|---|
| $\frac{1}{2}$ of 6 = | $\frac{1}{3}$ of 12 = | $\frac{1}{4}$ of 20 = | $\frac{1}{5}$ of 25 = |
| $\frac{1}{6}$ of 24 = | $\frac{1}{5}$ of 20 = | $\frac{1}{3}$ of 24 = | $\frac{1}{6}$ of 30 = |
| $\frac{1}{5}$ of 30 = | $\frac{1}{3}$ of 21 = | $\frac{1}{4}$ of 28 = | $\frac{1}{4}$ of 36 = |
| $\frac{1}{3}$ of 27 = | $\frac{1}{2}$ of 20 = | $\frac{1}{3}$ of 9 = | $\frac{1}{4}$ of 40 = |
| $\frac{1}{4}$ of 12 = | $\frac{1}{2}$ of 18 = | $\frac{1}{3}$ of 18 = | $\frac{1}{4}$ of 32 = |
| $\frac{1}{5}$ of 45 = | $\frac{1}{6}$ of 36 = | $\frac{1}{5}$ of 40 = | $\frac{1}{6}$ of 48 = |

Now try these story problems with fractions.

1. Tim's class of 27 children is divided into reading groups. One third of the class is in Tim's group. How many children are in his reading group? _____
2. Tim's group has read one fifth of the stories in the book. There are 35 stories in the book. How many stories have they read? _____
3. Tim had 20 arithmetic problems to solve. He finished one fourth of them before recess. How many problems were solved before recess? _____

Check the answers with page 40.



**Tim:** I bet I could eat a gallon of ice cream and never come up for a breath.

**Father:** Do you know how much a gallon of ice cream is?

**Tim:** Oh, about three or four good-sized dishes, I guess.

**Father:** Look, Tim, here are four quarts of ice cream. That's a gallon of ice cream. Could you eat that much at one sitting?

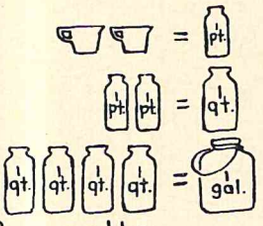
**Tim:** Maybe not. But, I bet I could eat a quart.

**Father:** You need a little help with measuring. Here, I'll make a chart for you to use.

2 cupfuls equal 1 pint (pt.)

2 pints equal 1 quart (qt.)

4 quarts equal 1 gallon (gal.)

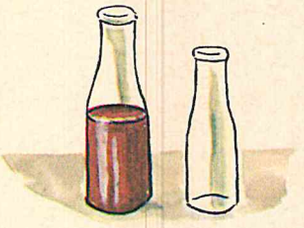


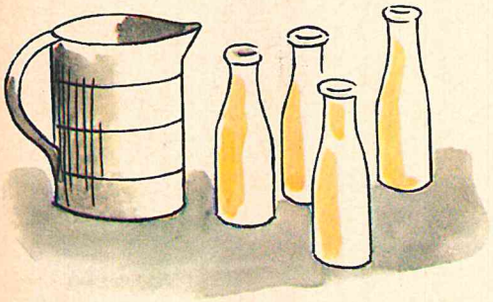

1 pint is $\frac{1}{2}$ of a quart. A quart is $\frac{1}{4}$ of a gallon.

**Father:** Pour this pint of chocolate milk into the empty quart bottle.

**Tim:** I did. It's only half full.

**Father:** Yes, because there are two pints in a quart.





**Father:** Here is a gallon measure. Use these quart bottles and fill the gallon measure with water.

**Tim:** There, I did it. I had to use four quarts of water. Now I know there really are four quarts in a gallon.

**Father:** Now may I serve you a gallon of ice cream, Son?

**Tim:** Not tonight. Thanks, Dad.

Fill in the blanks. Put a number in each.

There are _____ pints in a quart.

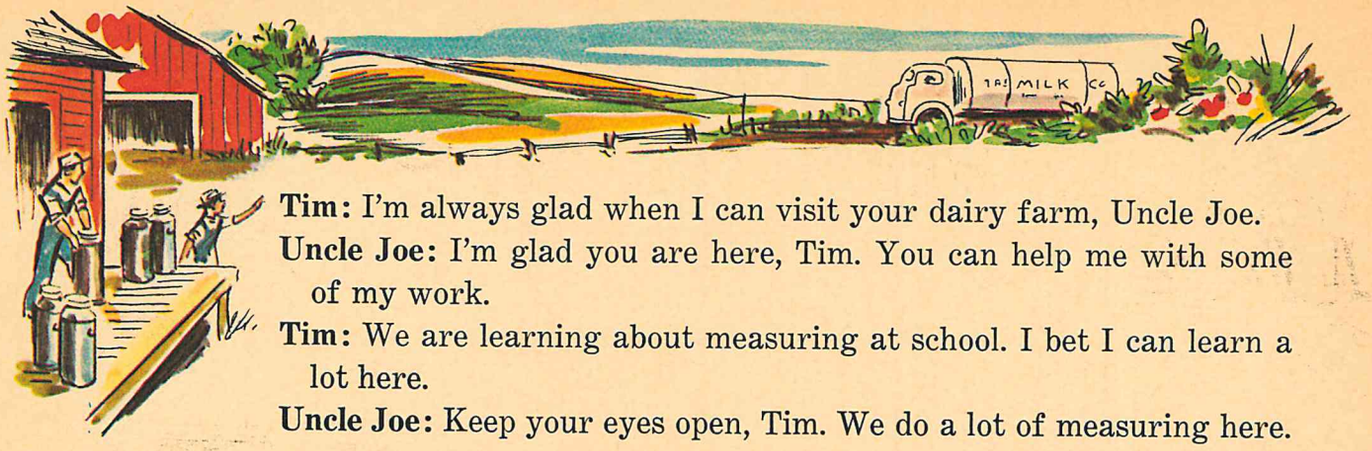
There are _____ pints in 2 quarts.

There are _____ quarts in a gallon.

There are _____ pints in a gallon.

Answers to problems on page 38: (1) Tim rode farther. (2) Tim's mother ate the smaller piece.

Answers to problems on page 39: (1) 9 children, (2) 7 stories, (3) 5 problems




**Tim:** I'm always glad when I can visit your dairy farm, Uncle Joe.

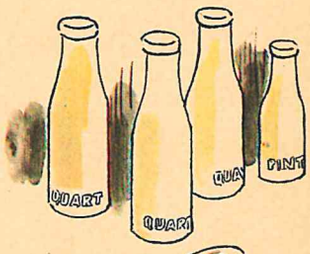
**Uncle Joe:** I'm glad you are here, Tim. You can help me with some of my work.

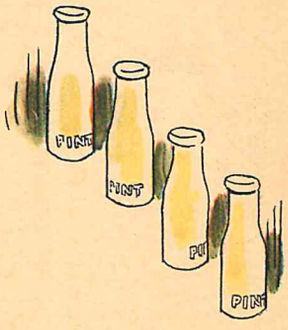
**Tim:** We are learning about measuring at school. I bet I can learn a lot here.

**Uncle Joe:** Keep your eyes open, Tim. We do a lot of measuring here.

Can you solve these problems about Uncle Joe's dairy farm?

1. Uncle Joe puts milk in cans that hold 5 gallons each. How many quarts are in each of those cans? 20
2. A truck picks up an average of 20 cans a day. How many gallons would that be? 100
3. How many gallons does the truck pick up in 7 days? 700
4. Tim's aunt uses 2 gallons of milk each week. How many quarts is that? 8
5. Tim drank one pint of milk. How many cupfuls is that? 2
6. The family used a half gallon of milk for dinner. How many quarts is that? 2
7. Tim's aunt keeps milk in a gallon jug. How many quarts is that? 4
8. How many pints does the gallon jug hold? 8
9. Tim's aunt asked him to check the milk in the refrigerator. Tim found a full gallon jug and 2 extra quarts. How many quarts was that? 6
10. Uncle Joe gave a neighbor 8 pints of milk. How many quarts was that? 4
11. Uncle Joe gave Tim 2 quarts of milk to take home. How many pints would that be? 4






Check your answers with page 45.

Make a list of things people buy that are measured in gallons, quarts, and pints. These measures are called *liquid measure*.

| Gallons | Quarts | Pints |
|---|---|---|
| Milk | Milk | Cream |
| | Fruit Juices | |
| | | |

**Tim:** Are you staying for Sports Club tonight?
**Bill:** I wouldn't miss it. We are having our games outside.
**Tim:** The leader said we would have relay races.
**Bill:** I hope all 24 boys are here so nobody will be left out.
**Tim:** What do you mean? Why would anyone be left out?
**Bill:** The teams have to be equal in number.
**Tim:** I get it. 24 divided by 2 means 12 on each team.
**Bill:** Boy, are you sharp!

Can you divide two-place numbers? Try it this way:

1 ten 2 ones
2 / 2 tens 4 ones

$2\overline{)24}$ means 2 / 2 tens 4 ones

divisor 12 ← quotient
↳ $2\overline{)24}$ ← dividend
2
4
4
0

Check by multiplying the quotient by the divisor.
12 x 2 = 24

**Be sure to write the quotient figure in the proper place.**

**If there is a quotient figure when dividing tens, be sure it is written in the tens' place.**

**When dividing ones, write the quotient figure in the ones' place.**

**Divide—multiply—subtract—bring down—repeat.**
Study these problems carefully. Are the answers (quotients) correct?

| | | | | | | |
|---|---|---|---|---|---|---|
| 23 | 13 | 12 | 13 | 12 | 11 | 13 |
| $3\overline{)69}$ | $2\overline{)26}$ | $4\overline{)48}$ | $5\overline{)65}$ | $6\overline{)72}$ | $7\overline{)77}$ | $8\overline{)104}$ |
| 6 | 2 | 4 | 5 | 6 | 7 | 8 |
| 9 | 6 | 8 | 15 | 12 | 7 | 24 |
| 9 | 6 | 8 | 15 | 12 | 7 | 24 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Now cover the above problems and try to solve them here.

| | | | | | | |
|---|---|---|---|---|---|---|
| $3\overline{)69}$ | $2\overline{)26}$ | $4\overline{)48}$ | $5\overline{)65}$ | $6\overline{)72}$ | $7\overline{)77}$ | $8\overline{)104}$ |

Try solving these problems in the same way:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $2\overline{)48}$ | $4\overline{)88}$ | $2\overline{)64}$ | $3\overline{)39}$ | $4\overline{)48}$ | $3\overline{)96}$ | $3\overline{)63}$ | $2\overline{)28}$ | $3\overline{)93}$ |
| $2\overline{)62}$ | $2\overline{)44}$ | $3\overline{)66}$ | $2\overline{)68}$ | $2\overline{)72}$ | $5\overline{)55}$ | $7\overline{)84}$ | $8\overline{)96}$ | $4\overline{)52}$ |

Check your answers by multiplying as you did on page 14.

**Bill:** My dad is a good bowler.
**Tim:** What do you mean? How good is he?
**Bill:** In two games his score was 424.
**Tim:** That *is* good. What was his score in each game?
**Bill:** That was the funny thing about it. His score was the same in each game.
**Tim:** I can figure that one out. I'll divide 424 by 2.
**Bill:** All right. What's the answer?
**Tim:** His score was 212 for each game.

$2\overline{)424}$ means $2\overline{)4}$ hundreds 2 tens 4 ones

Divide—multiply—subtract—bring down—repeat.

$$2\overline{)286}\quad 143 \qquad 4\overline{)848}\quad 212 \qquad 3\overline{)693}\quad 231$$

$$4\overline{)168}\quad 42 \qquad 4\overline{)368}\quad 92 \qquad 3\overline{)936}\quad 312$$

Cover the above problems and try to solve them here.

**$2\overline{)286}$** **$4\overline{)848}$** **$3\overline{)693}$** **$4\overline{)168}$** **$4\overline{)368}$** **$3\overline{)936}$**

Try solving these problems in the same way:

**$3\overline{)939}$** **$2\overline{)824}$** **$3\overline{)696}$** **$4\overline{)488}$** **$2\overline{)682}$** **$6\overline{)186}$** **$4\overline{)396}$**

**$4\overline{)168}$** **$3\overline{)663}$** **$2\overline{)428}$** **$4\overline{)844}$** **$3\overline{)699}$** **$5\overline{)355}$** **$3\overline{)219}$** **$2\overline{)164}$**

**$4\overline{)848}$** **$9\overline{)999}$** **$8\overline{)1688}$** **$7\overline{)777}$** **$6\overline{)1266}$** **$5\overline{)455}$** **$3\overline{)369}$** **$5\overline{)305}$**

Check your answers by multiplying as you did on page 14.

Try doing these story problems about bowling:

1. If Tim's father rolled the same in 2 games, and his score was 442, what was his score in each game? _____
2. One of the men rolled the same score in 3 games. His total score was 636. What was his score in each game? _____
3. Tim's mother likes to bowl, too. One day she had the same score in 2 games. Her total score was 288. What was her score in each game? _____

You will find the answers to the story problems on page 44.

**Mother:** We are glad you got home early today. We will have an early dinner and have time to play some games before Tim's bedtime.

**Father:** I made good time today. The new expressway means fewer traffic lights and fewer stops.

**Mother:** Yes, they have eliminated many of the stops.

**Tim:** That reminds me of something my teacher said today.

**Mother:** What was that?

**Tim:** She said, "Now that we understand what we are doing in division, we can eliminate some of the numbers we have been writing and move along faster."

**Mother:** Show us what you mean, Tim.

**Tim:** When I divide 242 by 2, it means first, 200 divided by 2. I write the 1 in the hundreds' column of the answer, or quotient. I leave blank the tens' and ones' columns. The same thing is true when I divide 4 tens by 2. I'm always careful to write the figures in my answer, or quotient, in the correct column.

212 315
3/636 5/1575

These are the problems that Tim solved for his mother and father. Prove that they are correct by multiplying the quotient by the divisor. Cover Tim's problems and see if you can solve them the way he did.

216 213
4/864 6/1278

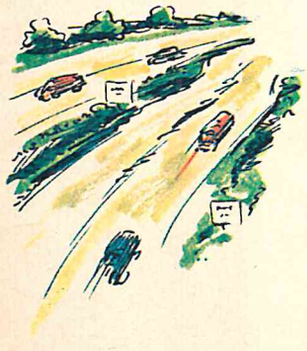
**3/636** **5/1575** **4/864** **6/1278**

Check your problems with Tim's problems.

Now try to solve these in the same way:

| | | | | | | |
|---|---|---|---|---|---|---|
| **3/642** | **5/675** | **4/736** | **6/930** | **2/468** | **7/784** | **8/976** |
| **5/690** | **4/464** | **8/992** | **3/492** | **9/648** | **7/483** | **6/108** |

Check your answers by multiplying.



1. In 5 evenings, Tim's father was able to be at home a total of 75 minutes earlier because of the better highway. How much longer was he at home each evening? _____
2. Another week, in 5 evenings he spent 90 minutes more with the family. How many minutes was that each evening? _____

You will find the answers to the story problems on page 46.

Answers to problems on page 43: (1) 221, (2) 212, (3) 144

**Polly:** That looks like fun. What are you doing?

**Tim:** I'm making drawings with zero. It's a very funny number.

**Polly:** What's funny about zero?

**Tim:** In arithmetic it means nothing. But if you leave it out of a place where it should be, the number is wrong.

**Polly:** That is true. Zero should be used where it belongs.

**Tim:** Look, Polly. If I were building a machine, I could take this round figure and call it a wheel. It is important in that place, isn't it?

**Polly:** Yes, it is. I never thought of it in that way. But, why this sudden interest in zero?

**Tim:** We are studying about zero in division. I'll show you.

$4\overline{)160}$ means $4\overline{)1 \text{ hundred} \quad 6 \text{ tens} \quad 0 \text{ ones}}$, or

$$4\overline{)160}\quad \begin{array}{r} 40 \\ 16 \\ \hline 0 \\ 0 \end{array}$$

$$\begin{array}{r} 40 \\ \times 4 \\ \hline 160 \end{array}$$

**Polly:** That's very good, Tim. Now shall I give you some problems?

**Tim:** Yes. I'll have time for about a dozen.

How many of these can you solve? Check each answer by multiplying.

$$2\overline{)60}\quad \begin{array}{r} 30 \\ 6 \\ 0 \\ 0 \end{array}$$

$$\begin{array}{r} 30 \\ \times 2 \\ \hline 60 \end{array}$$

$3\overline{)150}$ $\quad$ $6\overline{)240}$ $\quad$ $8\overline{)320}$

$9\overline{)450}$ $\quad$ $5\overline{)250}$ $\quad$ $2\overline{)180}$ $\quad$ $8\overline{)240}$

$6\overline{)180}$ $\quad$ $4\overline{)280}$ $\quad$ $7\overline{)350}$ $\quad$ $4\overline{)360}$

Answers to problems on page 35: Row A—45, 50, 57, 92, 112, 132, 118, 144, 115, 288, 171
Row B—134, 72, 104, 224, 158, 288, 174, 207, 154, 224, 116

Answers to problems on page 41: (1) 20 quarts, (2) 100 gallons, (3) 700 gallons, (4) 8 quarts, (5) 2 cupfuls, (6) 2 quarts, (7) 4 quarts, (8) 8 pints, (9) 6 quarts, (10) 4 quarts, (11) 4 pints

**Mother:** What are you thinking about, Tim?
**Tim:** We are having an arithmetic review tomorrow at school.
**Mother:** Are you worried about it?
**Tim:** I'm not really worried, but I think I'll practice for a while tonight. Will you give me some problems?

Can you solve the problems Tim's mother gave him for practice?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 35<br>+42 | 72<br>+23 | 83<br>+14 | 64<br>+75 | 95<br>+23 | 61<br>+87 | 39<br>+46 | 85<br>+65 | 27<br>+98 | 24<br>+56 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 72<br>87<br>+34 | 59<br>34<br>+62 | 42<br>27<br>+28 | 71<br>29<br>+47 | 15<br>13<br>+14 | 48<br>72<br>+64 | $2.57<br>+.34 | $6.08<br>+.96 | $3.64<br>+1.25 |

Subtract and check each answer:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 54<br>−23 | 76<br>−54 | 367<br>−152 | 658<br>−534 | 743<br>−521 | 86<br>−38 | 42<br>−14 | 93<br>−76 | 355<br>−139 | 677<br>−487 |

| | | | | | | |
|---|---|---|---|---|---|---|
| $1.55<br>−.67 | $2.08<br>−.49 | $4.25<br>−.58 | $2.49<br>−1.56 | $6.88<br>−4.29 | $7.50<br>−5.60 | $7.34<br>−3.89 |

Multiply:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 50<br>×6 | 60<br>×4 | 20<br>×9 | 70<br>×8 | 40<br>×3 | 80<br>×1 | 90<br>×5 | 30<br>×2 | 10<br>×7 | 200<br>×6 | 400<br>×5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 238<br>×3 | 631<br>×2 | 302<br>×4 | 423<br>×3 | 530<br>×2 | 37<br>×8 | 46<br>×5 | 79<br>×6 | 65<br>×7 | 58<br>×4 |

Divide: $3\overline{)276}$ $4\overline{)368}$ $5\overline{)450}$ $8\overline{)328}$ $5\overline{)305}$ $9\overline{)819}$ $9\overline{)810}$

$\frac{1}{4}$ of 36 = $\frac{1}{3}$ of 30 = $\frac{1}{4}$ of 48 = $\frac{1}{5}$ of 75 =

$\frac{1}{3}$ of 27 = $\frac{1}{6}$ of 42 = $\frac{1}{8}$ of 72 = $\frac{1}{7}$ of 56 =

Write Arabic numbers for these Roman numerals:

XIII ___ XVI ___ XX ___ XI ___ VIII ___ V ___

IV ___ X ___ VI ___ XV ___ IX ___ XII ___

Check answers to fractions and Roman numerals with page 48.

Check answers for multiplication and addition with page 51.

Answers to story problems on page 44: (1) 15 minutes, (2) 18 minutes

**Tim:** Mom gave me 50¢. She said I could buy as many cookies as the money would buy. I'd like to buy this box and that box. One is 19¢ and the other is 29¢. If I had a pencil I could figure how much the two boxes would cost.

**Polly:** You don't need a pencil for that. Just *estimate*.

**Tim:** Estimate? What do you mean?

**Polly:** You know that 19¢ is almost 20¢ and 29¢ is almost 30¢. How much are 20¢ and 30¢?

**Tim:** Say, that's pretty good. I can get both boxes and have 2¢ left. Let's walk around the store and do some more estimating. This is going to be fun.

Do *you* know how to estimate costs? Circle a number for each:

1. About how much money would you need for 2 pints of ice cream at 34¢ a pint? 50¢, 70¢, or 90¢?
2. Would 3 dozen oranges, at 49¢ a dozen, cost about $1.00, $1.50, or $2.00?

3. You have $2.00 to buy hamburger. If it is 59¢ a pound, can you buy 1 pound, 2 pounds, or 3 pounds?
4. If strawberries are 45¢ a box, how much money would you have to take to the store for 3 boxes? $1.00, $1.50, or $1.75?

5. The candy you want to buy is 29¢ a package. You want 3 packages. Will you need 75¢, $1.00, or $1.25?
6. Potato chips are 15¢ and 25¢ a bag. You want 3 bags and you have 70¢. Will you buy 3 15¢ bags or 3 25¢ bags?

7. A certain kind of soup is 39¢ for 2 cans. You are to buy 4 cans. Think how much 2 times 39¢ would be. Would you give the clerk 75¢, $1.00, or $1.50?
8. Suppose your total bill is $4.89 and you give the cashier $5.00. Will your change be about 10¢, 20¢, or 25¢?

Check your answers with page 50.

**Bill:** What are we making tonight?

**Tim:** Containers for our mothers.

**Bill:** How many cans do we have here that we may use?

**Tim:** There are 16 and I had trouble dividing them so it would be fair to the 7 boys at the meeting.

**Bill:** How did you finally do it?

**Tim:** My mother helped me. She showed me how to solve division problems when there is a remainder.

**Bill:** A remainder? Does that mean when there is something left over?

**Tim:** That's the idea.

**Bill:** All right. Show me how you do it.

**Tim:** The slow way would be to pass them out, one at a time, to the boys. My mother said it is better to divide and give each boy the number of cans he is to have. Look!

7 boys 16 cans
7 x 2 = 14
2 cans for each boy
2 cans left over (remainders)

$$7\overline{)16}\quad 2,\ 14,\ 2R$$

16 ÷ 7 = 2 and 2R

**Bill:** This sounds like fun. Let's do some more division problems with remainders. We'll know something the others in our class haven't studied.

$$6\overline{)20}\quad 3,\ 18,\ 2R \qquad 5\overline{)29}\quad 5,\ 25,\ 4R \qquad 3\overline{)19}\quad 6,\ 18,\ 1R$$

$$4\overline{)34}\quad 8,\ 32,\ 2R \qquad 7\overline{)51}\quad 7,\ 49,\ 2R \qquad 8\overline{)28}\quad 3,\ 24,\ 4R$$

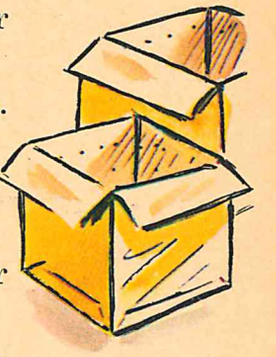
Try dividing the way Tim and Bill did. Each problem will have a remainder.

| | | | | | |
|---|---|---|---|---|---|
| **6/20** | **5/29** | **3/19** | **4/34** | **7/54** | **2/9** |
| **5/24** | **3/14** | **2/19** | **4/39** | **5/38** | **6/15** |

Check your answers with page 52.

Answers to problems on page 46: Fractions—First row—9, 10, 12, 15 Second row—9, 7, 9, 8 Arabic numbers—First row—13, 16, 20, 11, 8, 5 Second row—4, 10, 6, 15, 9, 12

**Bill:** The things that we made from the cans look nice, don't they? Where can we keep them until Mother's Day? We don't want our mothers to see them now.



**Tim:** We can pack them into these boxes and keep them in our garage.

**Bill:** Each box will hold 6 of them.

**Tim:** That's right. But we have 14.

**Bill:** Here we go with *uneven* division again.

**Tim:** Division with a remainder. Let me do the dividing. It's easy for me now.

**Bill:** We'll need more than 2 boxes. The third box will have 2 cans.

$$6\overline{)14}\ \begin{matrix}2\\12\\\hline 2R\end{matrix}\quad \text{2 ← quotient; divisor; } 6\times 2 = 12+2 = 14$$

$$7\overline{)29}\ \begin{matrix}4\\28\\\hline 1R\end{matrix}\quad 7\times 4 = 28+1 = 29$$

**Tim:** How do you check the answer when you divide uneven numbers?

**Mother:** Just multiply the quotient by the divisor. Then you add the remainder to it.

**Tim:** Let me try dividing uneven numbers and checking the answers.

| | | | | |
|---|---|---|---|---|
| $8\overline{)389}$ | $5\overline{)456}$ | $4\overline{)397}$ | $3\overline{)790}$ | $6\overline{)272}$ |
| $4\overline{)394}$ | $3\overline{)670}$ | $4\overline{)297}$ | $5\overline{)638}$ | $6\overline{)848}$ |
| $9\overline{)866}$ | $8\overline{)271}$ | $4\overline{)725}$ | $2\overline{)385}$ | $9\overline{)152}$ |
| $6\overline{)549}$ | $8\overline{)898}$ | $4\overline{)205}$ | $7\overline{)148}$ | $6\overline{)872}$ |

When Tim finished these problems, he tried writing Roman numerals from 1 to 24. Can you do it? Check them with page 31.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 _____ | 2 _____ | 3 _____ | 4 _____ | 5 _____ | 6 _____ | 7 _____ | 8 _____ |
| 9 _____ | 10 _____ | 11 _____ | 12 _____ | 13 _____ | 14 _____ | 15 _____ | 16 _____ |
| 17 _____ | 18 _____ | 19 _____ | 20 _____ | 21 _____ | 22 _____ | 23 _____ | 24 _____ |

You will find the answers for the division problems on page 50.

**Tim:** Will the new car fit into the garage, Dad?

**Father:** It will just barely fit. And we'll have to find another place for wagons, bike, boxes, and the lawn mower.

**Tim:** We can sell the lawn mower and hire someone to mow the lawn.

**Father:** That's definitely *out*, my boy. Mowing the lawn is your job. And we can't keep bikes and other things outside.

**Tim:** But we *will* get the new car won't we, Dad?

**Father:** This is going to take some figuring.

**Tim:** You said the new car is 7 feet wide and 16 feet long.

**Father:** Yes, and the garage door is 9 feet wide.

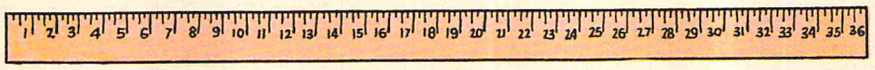
**Tim:** I measured the garage. It's 18 feet long. That wouldn't give Mom much room to spare when she drives in, would it?

**Father:** Your mother is a good driver, Tim. But it would be rather close, wouldn't it?

**Tim:** Let's figure just how much spare room there would be.

1 foot = 12 inches

3 feet = 1 yard



1 yard = 36 inches

Do *you* know about inches, feet, and yards? Fill in the blank spaces.

A foot is _____ inches. A yard is _____ inches. A yard is _____ feet.

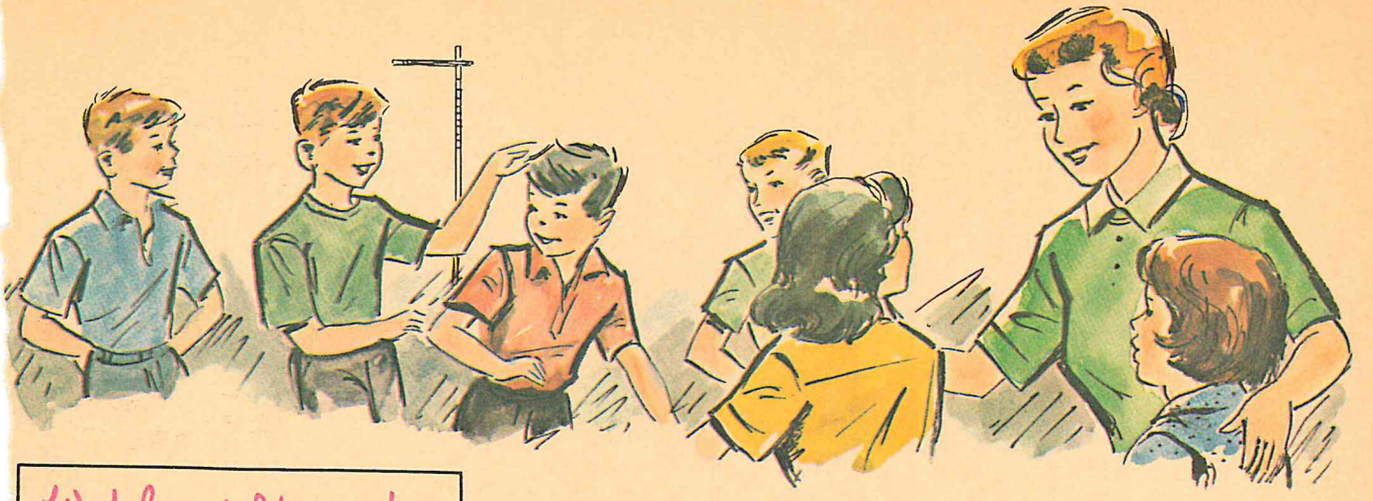
1. There are 12 inches in one foot. How many inches wide is the garage door? _____
2. There are 3 feet in one yard. How many yards wide is the garage door? _____
3. The garage is 18 feet long. How many inches is that? _____
4. How many yards long is the garage? _____
5. Which is longer, the new car or the garage? _____
6. How many feet longer is the garage than the car? _____
7. If the car is exactly in the middle of the garage, how many inches will be in front of the car? _____ How many inches in back? _____

Check your answers with page 52.

Answers to problems on page 47: (1) 70¢, (2) $1.50, (3) 3 pounds, (4) $1.50, (5) $1.00, (6) three 15¢ bags, (7) $1.00, (8) 10¢

Answers to division problems on page 49—R means remaining:

| | | | | |
|---|---|---|---|---|
| Row 1—48 and 5 R | 91 and 1 R | 99 and 1 R | 263 and 1 R | 45 and 2 R |
| Row 2—98 and 2 R | 223 and 1 R | 74 and 1 R | 127 and 3 R | 141 and 2 R |
| Row 3—96 and 2 R | 33 and 7 R | 181 and 1 R | 192 and 1 R | 16 and 8 R |
| Row 4—91 and 3 R | 112 and 2 R | 51 and 1 R | 21 and 1 R | 145 and 2 R |



## Watch us Grow!

| NAME | SEPT. | JAN. |
|---|---|---|
| Steve | 52 in. | 53 in. |
| John | 50 in. | 52 in. |
| Tim | 55 in. | 57 in. |
| Sam | 50 in. | 51 in. |
| Bill | 55 in. | 56 in. |
| Susan | 55 in. | 57 in. |
| Karen | 55 in. | 57 in. |
| Becky | 48 in. | 50 in. |
| Judy | 51 in. | 51 in. |
| Shirley | 53 in. | 56 in. |

**Tim:** How much taller are you now, in January, than you were in September?

**Bill:** I am one inch taller. How much have you grown?

**Tim:** I've grown two inches. That's an inch more than you've grown. Are you sure you've been eating your vegetables and drinking milk?

**Bill:** Yes, I have. Don't worry, I'll catch up with you soon.

**Tim:** I've grown in more ways than one. My mother says I've grown in arithmetic. I like it better every day. It is almost my favorite subject now.

**Bill:** I like arithmetic, too. Let's make up some problems from the Height Chart. I'll make up some for you and you make up some for me. We can check each other's answers.

**Tim:** Good idea! Let's get busy.

### Bill's Problems

1. Steve is now 53 inches tall. How tall is he in feet and inches? Feet _____ Inches _____
2. Tim was 55 inches in September. What was his height in feet and inches? Feet _____ Inches _____
3. How tall is Tim in January? Feet _____ Inches _____
4. How many children listed on the chart have grown 3 inches? _____
5. How many children have grown 2 inches? _____
6. How many have grown 1 inch? _____

### Tim's Problems

1. What is the name of the tallest boy in January? _____
2. What is his height in inches? _____
3. What is his height in feet and inches? Feet _____ Inches _____
4. Who is the shortest girl in January? _____
5. What is her height in feet and inches? Feet _____ Inches _____
6. Who stayed the same since September? _____ How tall is this child? Feet _____ Inches _____

Check your answers with page 52.

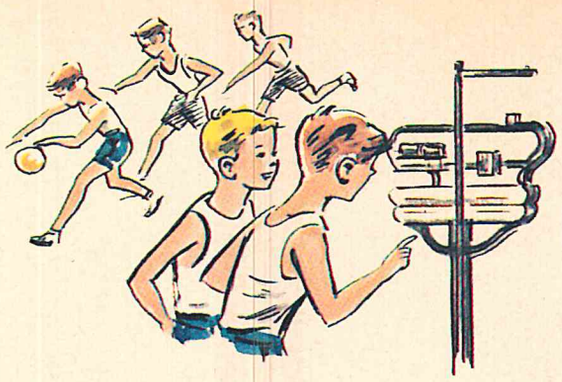
Answers for page 46: Addition—77, 95, 97, 139, 118, 148, 85, 150, 125, 80, 193, 155, 97, 147, 42, 184, $2.91, $7.04, $4.89 Multiplication—300, 240, 180, 560, 120, 80, 450, 60, 70, 1200, 2000, 714, 1262, 1208, 1269, 1060, 296, 230, 474, 455, 232

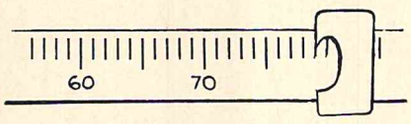
**Tim:** Can you read the weight on the scales?

**Bill:** Yes, each little line means one pound.

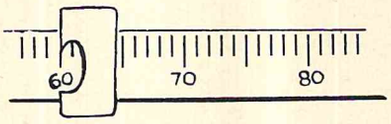
**Tim:** Our scales at home are different. Every 10 pounds, like 10, 20, 30, etc. is marked with the number. The marks that show every 5 pounds, like 5, 15, 25, etc. are just longer marks than the marks that show 1 pound.

**Bill:** Let's look at these scales and see how they are marked.

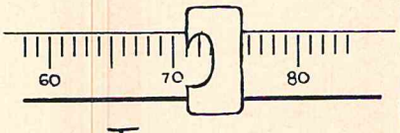




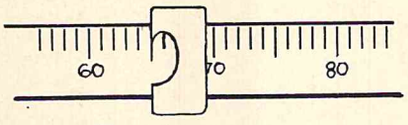

Eric



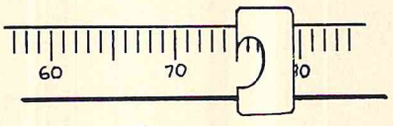

Ronnie



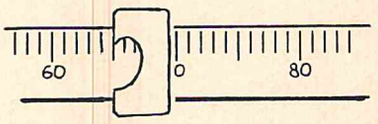

Tony



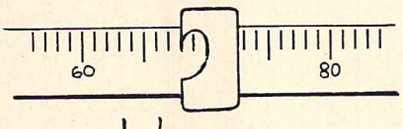

Ricky



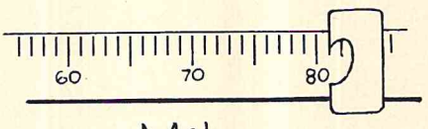

Tim



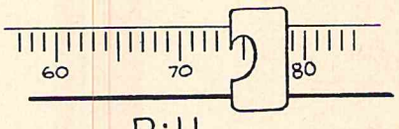

Pete




John




Mike




Bill

1. Who weighs more, Tim or Bill? _____
   How much more? _____
2. Who is the heaviest in the group? _____
3. Who weighs least? _____
4. What is the difference in pounds between the heaviest boy and the lightest boy? _____
5. Which two boys weigh the same? _____ _____
6. How much more does Tim weigh than John? _____
7. How much more does Eric weigh than Tim? _____
8. What is the combined weight of Tim and Bill? _____

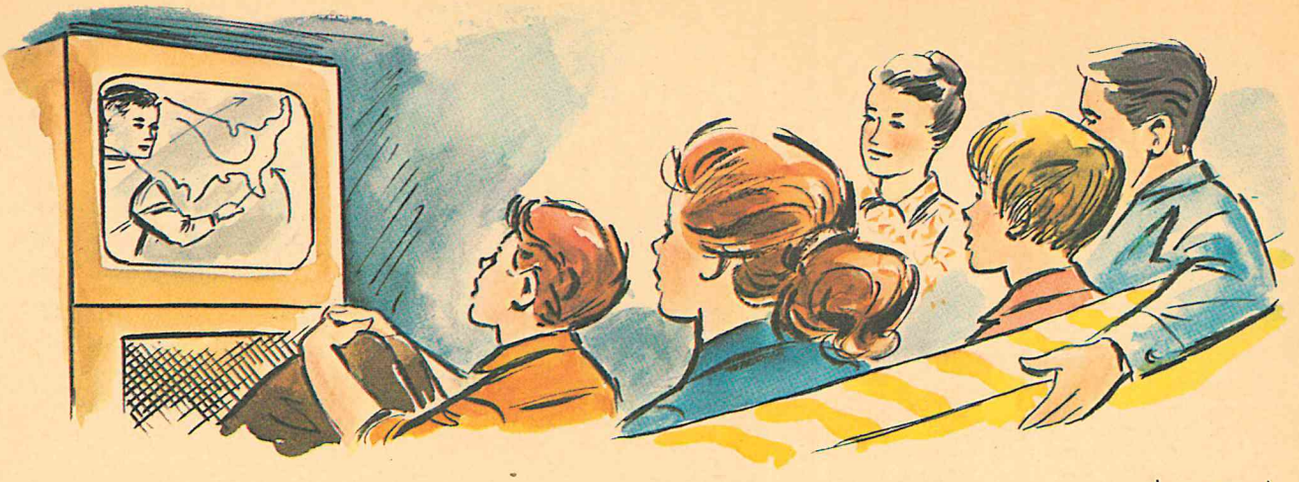
Check your answers with page 54.

Answers for page 48: First row—3 and 2 R, 5 and 4 R, 6 and 1 R, 8 and 2 R, 7 and 5 R, 4 and 1 R  Second row—4 and 4 R, 4 and 2 R, 9 and 1 R, 9 and 3 R, 7 and 3 R, 2 and 3 R

Answers to story problems on page 50: (1) 108 in., (2) 3 yds., (3) 216 in., (4) 6 yds., (5) garage, (6) 2 ft., (7) 12 in. front and 12 in. back

Answers to Bill's problems on page 51: (1) 4 ft. 5 in., (2) 4 ft. 7 in., (3) 4 ft. 9 in., (4) 1 child, (5) 5 children, (6) 3 children

Answers to Tim's problems on page 51: (1) Tim, (2) 57 in., (3) 4 ft. 9 in., (4) Becky, (5) 4 ft. 2 in., (6) Judy—4 ft. 3 in.



**Mother:** There is every kind of weather in the United States tonight.

**Father:** Wouldn't it be nice if people could be on the move all the time? Then everyone would be happy with the weather.

**Tim:** What do you mean?

**Father:** People who like hot weather could fly down to Florida, and those who like cold weather could fly north.

**Tim:** I wouldn't know whether I would go where I could swim or where I could ski.

**Mother:** What is the temperature here tonight? Please look at the outside thermometer, Tim. It must be very cold.

**Tim:** It is exactly zero. That means ice for skating. I wonder how warm it is in Florida.

**Father:** The weatherman said it is 80 degrees. How much warmer is it in Florida than here, Tim?

**Tim:** It is 80 degrees warmer there, isn't it, Dad?

**Father:** That's right, Son.

**Tim:** What is the red stuff in the thermometer?

**Father:** It is a liquid that moves up when it is warm and down when it is cool.

**Tim:** I can read a thermometer when the red is at the heavy marks near a number. But I just guess at the temperature when the red is between numbers.

**Mother:** There is no guesswork about a thermometer, Tim. Each short mark between numbers stands for 2 degrees.

**Father:** When the red is above zero, or 0, we know the temperature is above zero. When the red goes below 0, we know the temperature is below zero.

A

B

C

D

E

Write the degrees of temperature each thermometer shows.

Check your answers with page 55.

**Father:** I must drive to Chicago tomorrow and I'll have to start at 4 a.m.

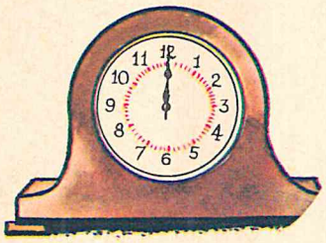
**Mother:** Must you leave so early?

**Father:** Yes, and I forgot to have the gas tank filled. I don't think the gas stations are open tonight.

**Tim:** The gas station on the corner of Maple and Main has a sign that says: *Open 24 Hours.* Doesn't that mean day and night?

**Father:** That's right! You've solved my problem. If you want to drive to the filling station with me, Tim, I'll buy you a soda.

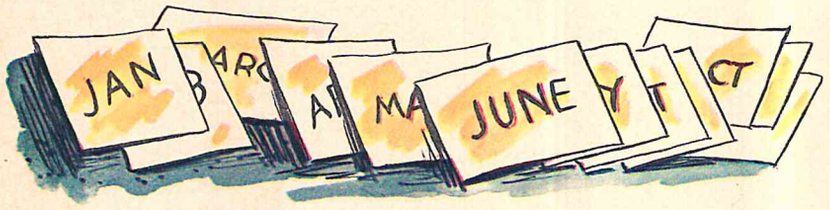
**Twelve o'clock at night is midnight. Twelve o'clock in the daytime is noon. A.M. means before noon. P.M. means afternoon. M. means noon. (Meridian)**



Can you solve these problems?

1. How many hours are there on a clock face? _____
2. How many hours in an entire day and night? _____
3. How many times does the long hand go around the clock in an entire day and night? _____
4. How many minutes does it take the minute hand to go around the clock once? _____

Study the following table. Then check your above answers.




Measures of Time

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
4 weeks = 1 month
52 weeks = 1 year
12 months = 1 year
1 year = 365 days
(Leap Year has 366 days)

Fill in the following spaces:

1. How many seconds in a minute? _____
2. How many seconds in 2 minutes? _____
3. How many hours in an entire day? _____
4. How many weeks in a year? _____
5. How many weeks in half a year? _____
6. How many months in half a year? _____
7. How many seconds in half a minute? _____
8. How many days in 2 weeks? _____

Abbreviations

minute—min.
second—sec.
day—da.
week—wk.
month—mo.
year—yr.

Check your answers with page 56.

Answers to problems on page 52: (1) Tim—1 lb., (2) Mike, (3) Ronnie, (4) 21 lbs., (5) Rickey and Pete, (6) 7 lbs., (7) 4 lbs., (8) 149 lbs.

**Polly:** What in the world are you doing, Tim?

**Tim:** I've just learned a new way to tell which months have 30 days and which have 31 days.

**Polly:** Don't you know the verse that tells the same thing? It goes like this: *30 days has September, April, June, and November. All the rest have 31, except February, which alone, has 28. But one day more we add to it one year in four.*

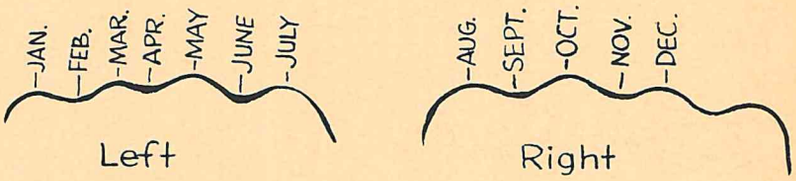
**Tim:** That's pretty good, but I'm looking for short cuts. My way is shorter.

**Polly:** Show me your way, Tim.

**Tim:** Close your hand and make a fist. Touch the knuckles and the places between the knuckles. The knuckles are months with 31 days. The low places between are months with 30 days.

**Polly:** I see what you mean. But what about February?

**Tim:** You'll have to remember that one. Now get your pencil and see how fast you can write the answers to some questions.

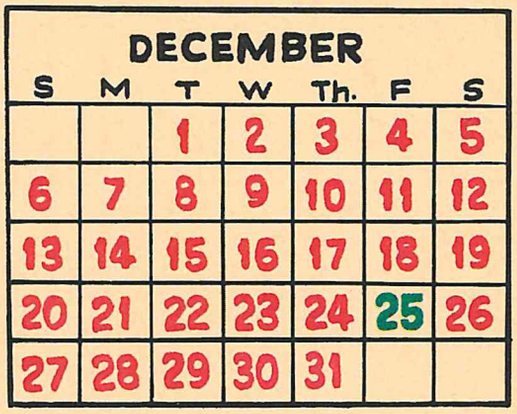



How many days in each month?

| | | | |
|---|---|---|---|
| April _____ | March _____ | June _____ | September _____ |
| May _____ | October _____ | December _____ | November _____ |
| July _____ | August _____ | January _____ | February ____ or ____ |

Look at this page from an old calendar.

Write the answers to the questions.



| DECEMBER | | | | | | |
|---|---|---|---|---|---|---|
| S | M | T | W | Th. | F | S |
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 | | |

1. How many Sundays? _____
2. What date is Christmas Day? _____
3. How many days in December? _____
4. What day is Christmas Day? _____
5. On what day is December 9? _____
6. On what day is November 30? _____
7. What day will January 1 be? _____

Check the answers with page 56.

Answers to problems on page 53: A—20 degrees above, B—10 degrees below, C—76 degrees above, D—2 degrees below, E—96 degrees above

**Tim:** There are 27 children in our class. I'm going to make a valentine for each of them. Wow! 27 valentines to make!

**Bill:** You aren't making one for yourself, are you?

**Tim:** Don't be funny! Of course, I'm not going to make one for myself. But I'll make one for my teacher. That still makes 27.

**Bill:** I guess you are right. I wasn't so funny, after all. Say, where did you get this punch-out kind? This is a lot easier for guys like us than cutting out all those hearts and things.

**Tim:** Mother bought them. Each valentine has 10 pieces, including the envelope.

**Bill:** So what?

**Tim:** I know how to multiply 27 × 10 to find how many pieces I'll need to punch out. Here, I'll show you. 10 means 1 ten and no ones.

**Bill:** Yes, go on.

**Tim:** First you multiply by the ones. Write the two zeros like this:

$$\begin{array}{r} 27 \\ \times 10 \\ \hline 00 \end{array}$$

Then multiply by the tens and write it like this:

$$\begin{array}{r} 27 \\ \times 10 \\ \hline 00 \\ 27 \\ \hline 270 \end{array}$$

Now add like this:

**Bill:** I get it. The answer is 270. Now let me do one.

**Tim:** Let's say there are 24 valentines with 10 parts each.

**Bill:** The answer is 240. Let me do some more.

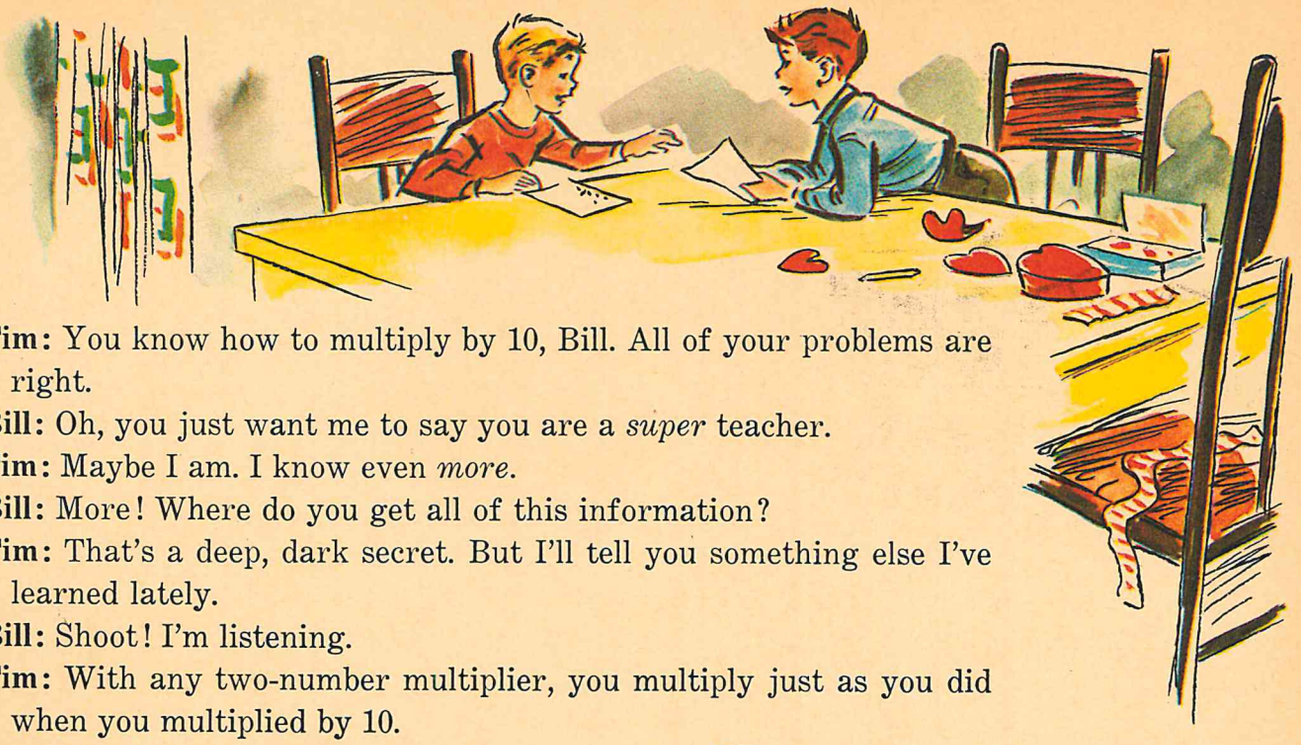
$$\begin{array}{r} 24 \\ \times 10 \\ \hline 00 \\ 24 \\ \hline 240 \end{array}$$

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **21** ×10 | **37** ×10 | **84** ×10 | **53** ×10 | **46** ×10 | **69** ×10 | **70** ×10 | **58** ×10 | **97** ×10 |
| **36** ×10 | **42** ×10 | **87** ×10 | **52** ×10 | **95** ×10 | **76** ×10 | **40** ×10 | **33** ×10 | **62** ×10 |

Check the answers with page 57.

Answers to problems on page 54: (1) 60 seconds, (2) 120 seconds, (3) 24 hours, (4) 52 weeks, (5) 26 weeks, (6) 6 months, (7) 30 seconds, (8) 14 days

Answers for problems on page 55: (1) 4 Sundays, (2) Dec. 25, (3) 31 days, (4) Friday, (5) Wednesday, (6) Monday, (7) Friday



**Tim:** You know how to multiply by 10, Bill. All of your problems are right.

**Bill:** Oh, you just want me to say you are a *super* teacher.

**Tim:** Maybe I am. I know even *more.*

**Bill:** More! Where do you get all of this information?

**Tim:** That's a deep, dark secret. But I'll tell you something else I've learned lately.

**Bill:** Shoot! I'm listening.

**Tim:** With any two-number multiplier, you multiply just as you did when you multiplied by 10.

**Bill:** How would I multiply 27 × 12?

**Tim:** Here, I'll show you. It's simple.

$$\begin{array}{r} 27 \\ \times 12 \\ \hline 54 \\ 27 \\ \hline 324 \end{array}$$

**Bill:** All right, Professor. So 27 × 12 is 324. Now let me show *you* how much 36 × 15 is.

$$\begin{array}{r} 36 \\ \times 15 \\ \hline 180 \\ 36 \\ \hline 540 \end{array}$$

**Tim:** Pretty good! Now will you say I'm a super teacher?

**Bill:** I'll have to admit it, old man. Now, let's do some more problems. I'll think up some for you and you think up some for me. Let's each do ten problems.

Here are Tim's problems.
Can you solve them?

| | | | | |
|---|---|---|---|---|
| 53 | 32 | 26 | 16 | 34 |
| ×12 | ×25 | ×15 | ×20 | ×21 |
| 63 | 81 | 47 | 89 | 38 |
| ×21 | ×22 | ×43 | ×31 | ×31 |

Here are Bill's problems.
Can you solve them?

| | | | | |
|---|---|---|---|---|
| 18 | 23 | 43 | 15 | 37 |
| ×30 | ×28 | ×24 | ×13 | ×50 |
| 75 | 26 | 66 | 47 | 92 |
| ×47 | ×60 | ×28 | ×39 | ×45 |

Check your answers with page 58.

Answers for problems on page 56: First row—210, 370, 840, 530, 460, 690, 700, 580, 970
Second row—360, 420, 870, 520, 950, 760, 400, 330, 620

**Polly:** I hope we make a lot of money with this paper sale.
**Tim:** It's more work than I thought it would be.
**Polly:** Who cut all the ropes to tie the bundles?
**Tim:** I did. I cut each rope nine feet long. How many yards long is each rope? Do you know?
**Polly:** Nine feet is three yards. Right?
**Tim:** Right!

Can you solve these problems about the paper sale?

1. Tim worked cutting rope from 9:15 until 10:00 a.m. How long did it take him? _____
2. The boys helped to load tho bundles onto trucks. They began at 11:15 and worked until 12:15 p.m. How long did that take? _____
3. It was a chilly day. The thermometer looked like this: What was the temperature? _____

4. The 6 boys loaded 90 bundles onto the trucks. Each boy loaded the same number. How many did each boy load? _____
5. Tim had 57 magazines to tie into 3 bundles. How many did he put into each bundle? _____
6. People phoned the school to ask boys to pick up papers at their homes. If 3 boys went to 10 homes, each, how many homes did the boys go to? _____
7. There were 14 children who brought an equal amount of paper for the sale. The school will receive 75¢ for the paper each of these children brought. How much money will that be? _____

Solve these multiplication and division problems:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 74 ×30 | 38 ×70 | 96 ×50 | 27 ×31 | 273 ×25 | 164 ×43 | 542 ×60 | 470 ×73 |

| | | | | | | |
|---|---|---|---|---|---|---|
| $9\overline{)657}$ | $6\overline{)390}$ | $6\overline{)450}$ | $8\overline{)472}$ | $4\overline{)116}$ | $3\overline{)228}$ | $9\overline{)225}$ |

Check your answers with page 60.

Answers for problems on page 57: Tim's problems—First row: 636, 800, 390, 320, 714 Second row: 1323, 1782, 2021, 2759, 1178 Bill's problems—First row: 540, 644, 1032, 195, 1850 Second row: 3525, 1560, 1848, 1833, 4140

**Bill:** Look! Here's an old arithmetic book my dad had when he was a boy.

**Tim:** Does it have any division problems with remainders in the answers? I need some practice with those.

**Bill:** Yes, here is a page of problems like that and one problem is all worked out to show how to do it.

**Tim:** Now I remember how to do them. Let's get going on this page.

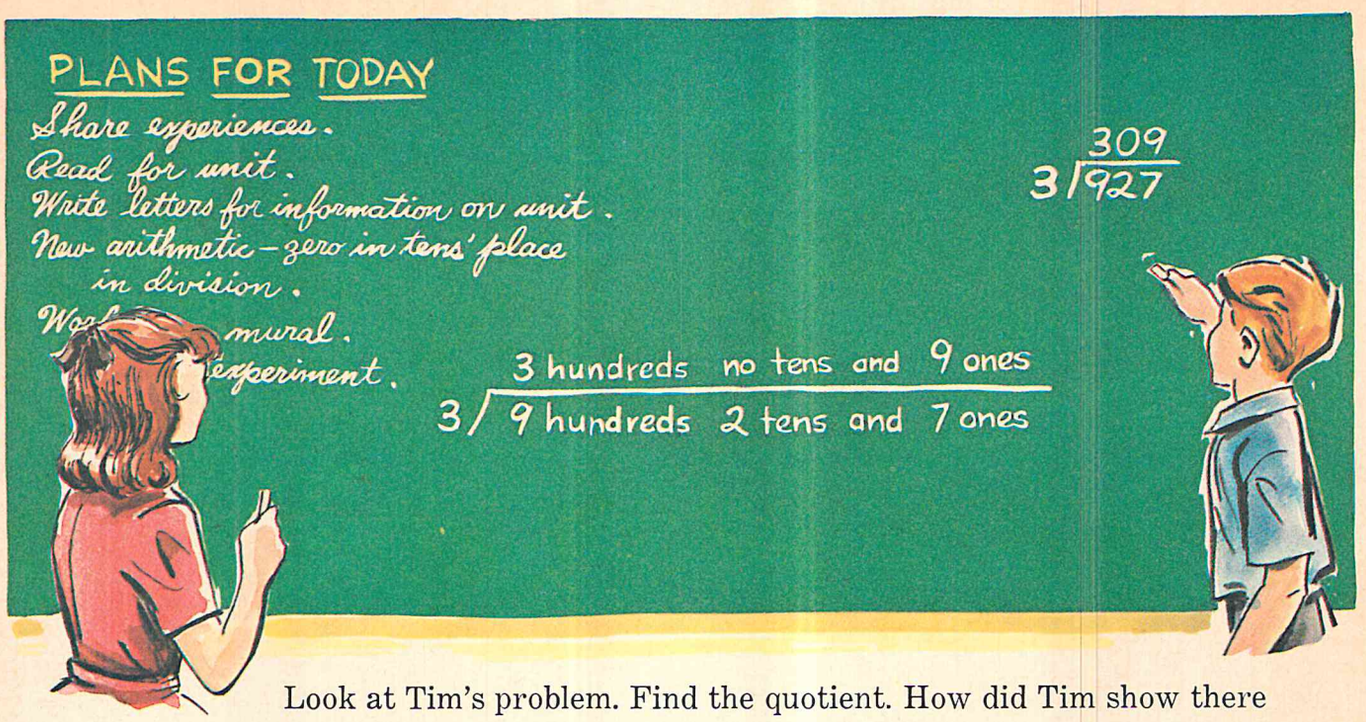
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $2/\overline{9}$ | $3/\overline{13}$ | $4/\overline{23}$ | $5/\overline{32}$ | $6/\overline{20}$ | $7/\overline{46}$ | $8/\overline{66}$ | $9/\overline{40}$ |
| $5/\overline{97}$ | $3/\overline{47}$ | $6/\overline{75}$ | $6/\overline{83}$ | $5/\overline{348}$ | $3/\overline{295}$ | $4/\overline{317}$ | $6/\overline{454}$ |
| $6/\overline{329}$ | $8/\overline{291}$ | $7/\overline{458}$ | $6/\overline{563}$ | $5/\overline{469}$ | $7/\overline{374}$ | $8/\overline{178}$ | $6/\overline{207}$ |
| $9/\overline{294}$ | $7/\overline{486}$ | $6/\overline{590}$ | $7/\overline{386}$ | $8/\overline{170}$ | $3/\overline{295}$ | $6/\overline{581}$ | $7/\overline{590}$ |
| $2/\overline{157}$ | $7/\overline{508}$ | $5/\overline{179}$ | $7/\overline{586}$ | $8/\overline{334}$ | $7/\overline{513}$ | $5/\overline{384}$ | $9/\overline{483}$ |

Check each answer. Multiply the quotient by the divisor. Add the remainder.

Now try these story problems:

1. Tim and Bill ate 3 candy bars between them while they solved the above problems. How many did each boy eat? _____
2. They also ate 5 small packages of potato chips. How many did each boy eat? _____
3. They drank 4 bottles of pop. How many did each one drink? _____
4. They will go to bed tonight at 10:30 and get 10 hours' sleep. What time will they get up? _____

Check the story problems with page 60.




Look at Tim's problem. Find the quotient. How did Tim show there were no tens in the tens' place in the quotient? _____

Did the two children get the same answer? _____ Are the answers correct? _____

In division, each time we bring down a number we must write a figure in the quotient. If the number to be divided is smaller than the divisor, we write 0 in the quotient.

Each of these problems will have 0 in the quotient. Can you solve them? Check your answers by multiplying the quotient by the divisor.

| | | | | | |
|---|---|---|---|---|---|
| 6/3018 | 7/4249 | 5/2535 | 4/1628 | 3/1530 | 2/1218 |
| 8/7248 | 9/36045 | 7/2842 | 6/2406 | 5/5515 | 3/6246 |
| 4/8432 | 2/5012 | 3/9621 | 8/8560 | 9/9009 | 6/3654 |

Answers to problems on page 58: Multiplication—2220, 2660, 4800, 837, 6825, 7052, 32520, 34310 Division—73, 65, 75, 59, 29, 76, 25

Answers to story problems on page 58: (1) 45 minutes, (2) 1 hour, (3) 40 degrees, (4) 15 bundles, (5) 19 magazines, (6) 30, (7) $10.50

Answers to story problems on page 59: (1) 1½, (2) 2½, (3) 2, (4) 8:30

**Bill:** Where did you get the keen models?
**Tim:** I bought them at the Hobby Store.
**Bill:** How many did you buy?
**Tim:** I bought three and they cost 49¢ each.
**Bill:** I think I'll buy some.
**Tim:** There was another one I wanted but I didn't have enough money.

1. How much did Tim pay for the 3 models? _____
2. If Tim had $1.50, how much money did he get back? _____
3. How much would 4 models cost? _____
4. If Bill bought 2 models, how much would that be? _____

**When multiplying money problems, be sure there are two places, or two figures, on the right of the decimal point.**

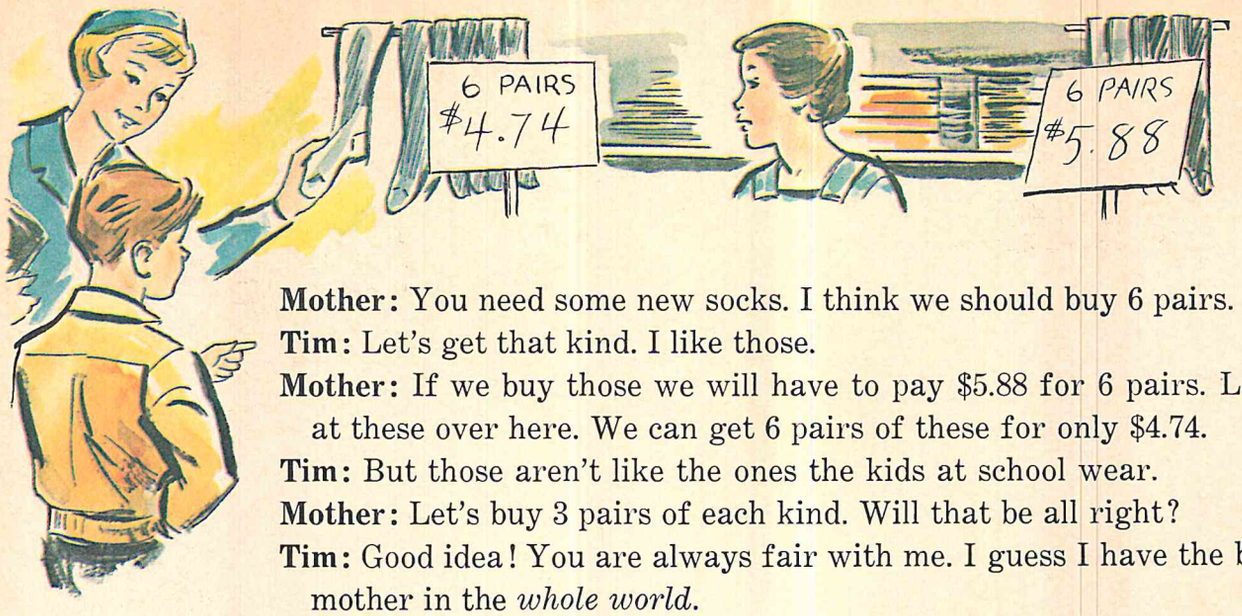
| | | | | | | |
|---|---|---|---|---|---|---|
| $1.00 ×4 | $3.75 ×6 | $6.05 ×7 | $8.92 ×5 | $7.50 ×8 | $12.36 ×2 | $10.00 ×9 |
| $4.00 | $22.50 | $42.35 | $44.60 | $60.00 | $24.72 | $90.00 |

Multiply these problems. Be sure to place the dollar sign and the decimal point where they belong to show dollars and cents.

| | | | | | | |
|---|---|---|---|---|---|---|
| $2.93 ×5 | $8.65 ×6 | $5.90 ×7 | $6.08 ×8 | $3.84 ×9 | $4.51 ×4 | $3.09 ×3 |
| $23.41 ×2 | $12.24 ×9 | $44.32 ×6 | $10.80 ×5 | $20.14 ×3 | $50.90 ×4 | $76.14 ×7 |

1. Tim bought 4 records at $1.98 each. How much did the records cost? _____
2. Tim gave the clerk $10.00. How much change did he receive? _____
3. Bill bought a book about model airplanes and another about antique automobiles. Each book cost $2.98. How much did he pay for both books? _____
4. Bill had a five-dollar bill and three one-dollar bills. What bills should he give the clerk? _____
5. How much change did Bill receive? _____
6. After paying for the books, how much money did Bill have left? _____

Check your answers with page 62.




**Mother:** You need some new socks. I think we should buy 6 pairs.
**Tim:** Let's get that kind. I like those.
**Mother:** If we buy those we will have to pay $5.88 for 6 pairs. Look at these over here. We can get 6 pairs of these for only $4.74.
**Tim:** But those aren't like the ones the kids at school wear.
**Mother:** Let's buy 3 pairs of each kind. Will that be all right?
**Tim:** Good idea! You are always fair with me. I guess I have the best mother in the *whole world.*
**Mother:** Why, thank you, Tim. You always try to be fair, too.

When dividing number problems, be sure to place the dollar sign and decimal point first. There must be two places on the right of the decimal, or cents, point.

1. If 6 pairs of socks cost $5.88, how much will 1 pair cost? _____
2. If 6 pairs of socks cost $4.74, how much will 1 pair cost? _____
3. Tim bought 3 pairs for 98¢ each. How much did he pay for 3 pairs? _____
4. How much were 3 pairs at 79¢ a pair? _____
5. How much did they pay for the 6 pairs they bought? _____
6. How much did they save by buying 3 pairs of each kind? _____

Check your answers with page 68.

Look at these money problems. Place the dollar sign and cents point in the following quotients (answers).

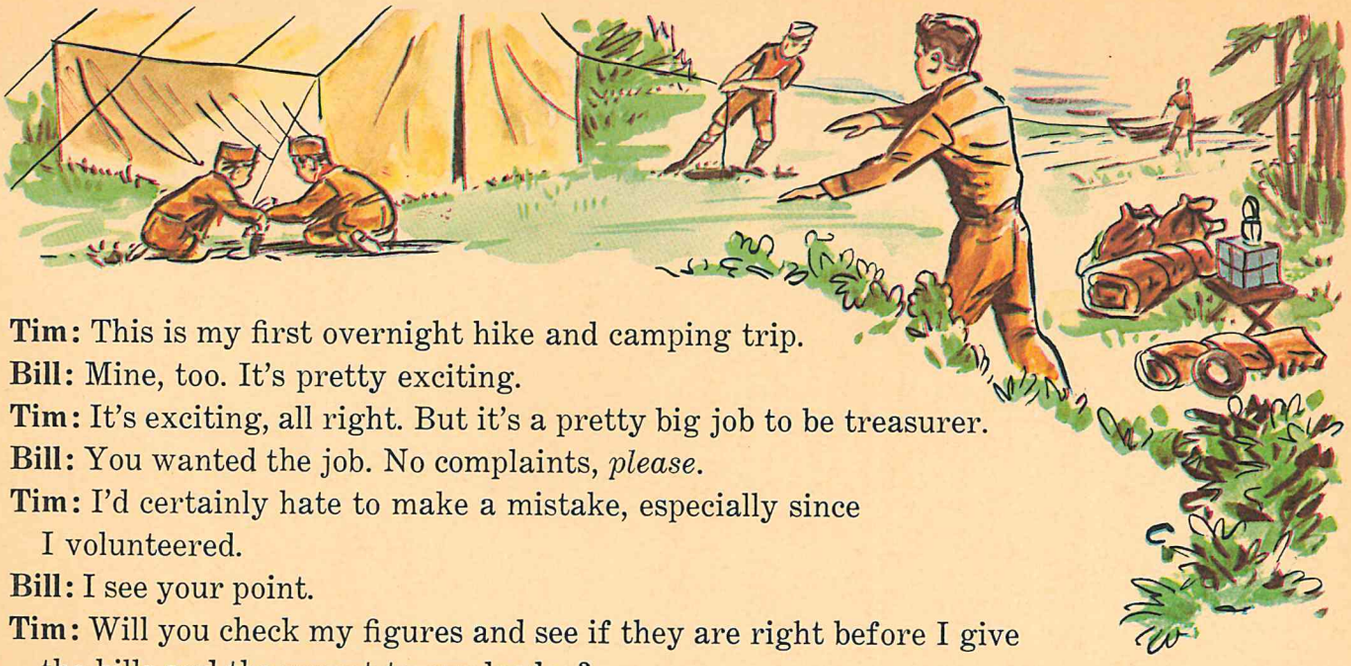
Divide and place the correct marks in each quotient.

**5/$8.80** **7/$6.44** **4/$11.00** **6/$40.50** **8/$27.12**

Check each answer by multiplying the quotient by the divisor.

Answers to story problems on page 61: $1.47, 3¢, $1.96, 98¢

Answers to problems on page 61: Row 1—$14.65, $51.90, $41.30, $48.64, $34.56, $18.04, $9.27 Row 2—$46.82, $110.16, $265.92, $54.00, $60.42, $203.60, $532.98
Answers to story problems: (1) $7.92, (2) $2.08, (3) $5.96, (4) $5.00 and $1.00, (5) 4¢, (6) $2.04



**Tim:** This is my first overnight hike and camping trip.
**Bill:** Mine, too. It's pretty exciting.
**Tim:** It's exciting, all right. But it's a pretty big job to be treasurer.
**Bill:** You wanted the job. No complaints, *please.*
**Tim:** I'd certainly hate to make a mistake, especially since I volunteered.
**Bill:** I see your point.
**Tim:** Will you check my figures and see if they are right before I give the bills and the report to our leader?
**Bill:** You flatter me, my friend. But, I'll help you out if I can.
**Tim:** This is a record of what we bought:

| | |
|---|---|
| sleeping bags | $51.80 |
| tent | 20.00 |
| utensils | 9.64 |
| food | 18.60 |
| camping fee | 4.00 |
| gas and oil | 5.80 |

**Tim:** The column was too long for me to add. I did it this way:

| | | | |
|---|---|---|---|
| $51.80 | $9.64 | $4.00 | $71.80 |
| +20.00 | +18.60 | +5.80 | 28.24 |
| $71.80 | $28.24 | $9.80 | +9.80 |
| | | | $109.84 |

Are Tim's answers correct? Add each column to find out.

1. What was the total cost for the 4 boys? _____
2. What was each boy's share of the total cost? _____
3. Each boy had earned $20.00. How much more would he need? _____
4. If the tent cost $20.00, what was each boy's share of the cost of the tent? _____
5. If 4 sleeping bags cost $51.80, how much did 1 cost? _____
6. What was each boy's share in the cost of utensils? _____
7. What was each boy's share in the cost of food? _____
8. What was each boy's share in the cost of the camping fee? _____
9. What was each boy's share in the cost of gas and oil? _____

Answers on page 64.

| BILL'S REPORT CARD | NUMBER CORRECT |
|---|---|
| I Multiply and Carry | |
| II Fractions | |
| III Liquid Measure | |
| IV Division | |
| V Division with R | |
| VI Measurement - Length | |

**Tim:** I have an idea.

**Bill:** You are full of ideas. Some are good and some aren't so good. What's this one?

**Tim:** This is a good one. I'll make a review test for you and you make one for me. We will grade each other's paper and make out report cards.

**Bill:** How will we grade them?

**Tim:** Your grade will be the number you get right in each kind of problem.

This is the test Tim made for Bill. Can you solve Bill's problems?

I Multiply and carry:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 34 | 58 | 76 | 95 | 67 | 83 | 217 | 846 | 384 |
| $\times 5$ | $\times 6$ | $\times 4$ | $\times 5$ | $\times 3$ | $\times 9$ | $\times 2$ | $\times 7$ | $\times 8$ |

II Fractions:

1. $\frac{1}{2}$ of 24 = _____
2. $\frac{1}{4}$ of 100 = _____
3. $\frac{1}{2}$ of 18 = _____
4. $\frac{1}{2}$ of 56 = _____
5. $\frac{1}{4}$ of 84 = _____
6. $\frac{1}{3}$ of 15 = _____
7. $\frac{1}{3}$ of 18 = _____
8. $\frac{1}{5}$ of 100 = _____
9. $\frac{1}{5}$ of 75 = _____

III Liquid measure:

1. 4 pt. = _____ qt.
2. 8 pt. = _____ gal.
3. 2 pt. = _____ qt.
4. 8 pt. = _____ qt.
5. 4 qt. = _____ gal.
6. 10 pt. = _____ qt.
7. 8 qt. = _____ gal.
8. 16 qt. = _____ gal.
9. 6 pt. = _____ qt.

IV Division:

5/265 3/816 6/1842 4/764 7/2863 8/800 9/927

V Division with a remainder:

3/694 2/593 4/963 5/513 7/499 9/741 6/1238

VI Measurements of length:

1. 12 in. = _____ ft.
2. 2 ft. = _____ in.
3. 3 ft. = _____ yd.
4. 9 yd. = _____ ft.
5. 48 in. = _____ yd. and _____ ft.
6. 29 in. = _____ ft. and _____ in.
7. 72 in. = _____ yds.
8. 12 ft. = _____ yds.

Check Bill's answers with page 73.

Answers to problems on page 63: (1) \$109.84, (2) \$27.46, (3) \$7.46, (4) \$5.00, (5) \$12.95, (6) \$2.41, (7) \$4.65, (8) \$1.00, (9) \$1.45

| TIM'S REPORT CARD | NUMBER CORRECT |
|---|---|
| I Multiply and Carry | |
| II Fractions | |
| III Liquid Measure | |
| IV Division | |
| V Division with R | |
| VI Measurement - Length | |

**Tim:** Will my test have the same number of problems as yours?

**Bill:** Yes, we'll be fair about everything.

**Tim:** Let's correct each other's answers.

**Bill:** Okay. This whole thing isn't a bad idea. Maybe we can talk some of the other kids into doing it.

**Tim:** Maybe. But don't forget that it was *my* idea.

**Bill:** Sure. I'll see that you get the credit.

This is the test Bill made for Tim.

I Multiply and carry:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 43 ×5 | 85 ×6 | 67 ×4 | 59 ×5 | 76 ×3 | 38 ×9 | 127 ×2 | 648 ×7 | 483 ×8 |

II Fractions:

1. $\frac{1}{2}$ of 36 = _____
2. $\frac{1}{4}$ of 48 = _____
3. $\frac{1}{2}$ of 18 = _____
4. $\frac{1}{4}$ of 96 = _____
5. $\frac{1}{6}$ of 84 = _____
6. $\frac{1}{3}$ of 39 = _____
7. $\frac{1}{3}$ of 45 = _____
8. $\frac{1}{5}$ of 85 = _____
9. $\frac{1}{6}$ of 42 = _____

III Liquid measure:

1. 2 pt. = _____ qt.
2. 1 qt. = _____ pt.
3. 1 gal. = _____ qt.
4. 2 gal. = _____ qt.
5. 4 pt. = _____ qt.
6. 2 gal. = _____ pt.
7. 16 pt. = _____ qt.
8. 3 gal. = _____ qt.
9. 1 gal. = _____ pt.

IV Division:

| | | | | | | |
|---|---|---|---|---|---|---|
| $5\overline{)625}$ | $3\overline{)618}$ | $6\overline{)4218}$ | $4\overline{)476}$ | $7\overline{)3682}$ | $8\overline{)808}$ | $9\overline{)729}$ |

V Division with a remainder:

| | | | | | | |
|---|---|---|---|---|---|---|
| $3\overline{)496}$ | $2\overline{)395}$ | $4\overline{)369}$ | $5\overline{)153}$ | $7\overline{)950}$ | $9\overline{)147}$ | $6\overline{)3821}$ |

VI Measurements of length:

1. 2 ft. = _____ in.
2. 24 in. = _____ ft.
3. 1 ft. = _____ in.
4. 15 ft. = _____ yd.
5. 30 in. = _____ ft. and _____ in.
6. 40 ft. = _____ yd. and _____ ft.
7. 3 yd. = _____ in.
8. 5 ft. = _____ in.

Check Tim's answers with page 68.

| TIM'S REPORT CARD | NUMBER CORRECT |
|---|---|
| I Measurement of Time | |
| II Calendar | |
| III Multiplication by 10 | |
| IV Division - 0 in Quotient | |
| V Multiplication – Money | |
| VI Division with Money | |

**Bill:** That report card idea of yours was good. But we didn't test each other on everything we've learned this year.

**Tim:** Great minds! I was thinking the same thing.

**Bill:** Let's get busy and make some more tests.

**Tim:** I'm on my way.

Here is the second test that Bill made for Tim.

I Measurements of time:

1. 1 min. = _____ sec.
2. 1 yr. = _____ wk.
3. 1 hr. = _____ min.
4. 1 wk. = _____ da.
5. 3 yr. = _____ mo.
6. 104 wk. = _____ yr.
7. 1 yr. = _____ mo.
8. 10 min. = _____ sec.
9. 1 da. = _____ hr.

II The calendar:

1. How many days in March? _____ June? _____ September? _____ May? _____
2. When does February have 29 days? _____
3. What day of the week follows Monday? _____
4. How many months have 30 days? _____
5. What day of the week is immediately before Wednesday? _____

III Multiplication by 10:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 56 | 47 | 83 | 29 | 18 | 46 | 72 | 34 | 61 | 92 |
| ×10 | ×20 | ×40 | ×80 | ×60 | ×30 | ×10 | ×90 | ×50 | ×70 |

IV Division with 0 in quotient:

5/2545 3/612 4/2432 8/824 9/1818 7/707 6/1854 2/1016

V Multiplication with money problems:

| | | | | | | |
|---|---|---|---|---|---|---|
| $3.87 | $6.54 | $10.75 | $7.93 | $4.98 | $9.65 | $14.30 |
| ×4 | ×7 | ×3 | ×6 | ×5 | ×2 | ×5 |

VI Division with money problems:

2/$4.68 8/$16.32 9/$27.63 3/$4.50 5/$225.65

Check Tim's answers with page 70.

| BILL'S REPORT CARD | NUMBER CORRECT |
|---|---|
| I Measurement of Time | |
| II Calendar | |
| III Multiplication by 10 | |
| IV Division - 0 in Quotient | |
| V Multiplication - Money | |
| VI Division with Money | |

**Tim:** Did you know that Jerry and Eric are giving tests to each other, too?

**Bill:** They are just copying our idea.

**Tim:** Well, it won't hurt us to share our ideas.

**Bill:** I suppose so. But why can't they think up their own ideas?

**Tim:** Let's forget it. Here's your second test.

Here is Bill's second test.

I Measurement of time:

1. 1 min. = _____ sec.
2. 1 yr. = _____ wk.
3. 1 hr. = _____ min.
4. 2 yr. = _____ wk.
5. 3 yr. = _____ wk.
6. 1 da. = _____ hr.
7. 1 wk. = _____ da.
8. 48 mo. = _____ yr.
9. 48 hr. = _____ da.

II The calendar:

1. How many days in January? _____ August? _____ December? _____
2. If July 4 is on Thursday, on what day will July 11 be? _____
3. How many days are there in Leap Year? _____
4. What day of the week follows Friday? _____
5. What is the third month of the year? _____

III Multiplication by 10:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 65 | 74 | 38 | 92 | 81 | 64 | 27 | 43 | 16 | 29 |
| ×10 | ×20 | ×40 | ×80 | ×60 | ×30 | ×10 | ×90 | ×50 | ×70 |

IV Division with zero in the quotient:

$5\overline{)4525}$ $3\overline{)918}$ $4\overline{)3224}$ $8\overline{)1672}$ $9\overline{)8181}$ $7\overline{)735}$ $6\overline{)5418}$

V Multiplication with money problems:

| | | | | | | |
|---|---|---|---|---|---|---|
| $7.83 | $4.56 | $57.01 | $3.97 | $30.41 | $2.98 | $39.98 |
| ×4 | ×7 | ×3 | ×6 | ×5 | ×4 | ×2 |

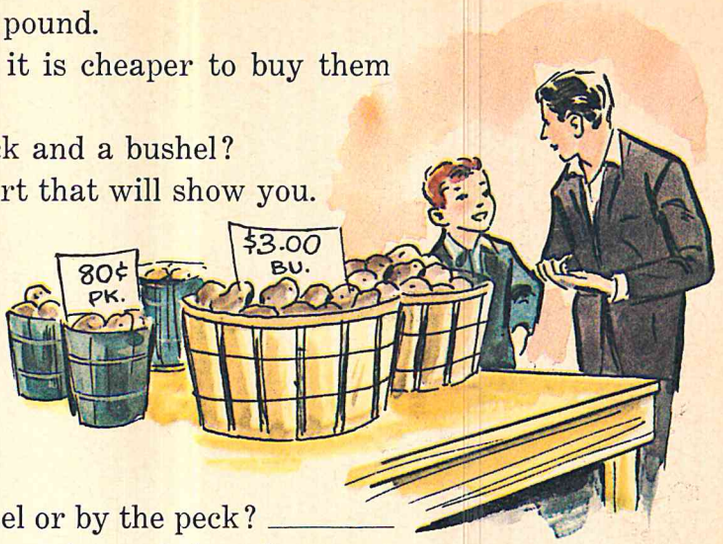
VI Division with money problems:

$2\overline{)\$8.64}$ $8\overline{)\$32.16}$ $9\overline{)\$63.27}$ $3\overline{)\$540}$ $5\overline{)\$175.15}$

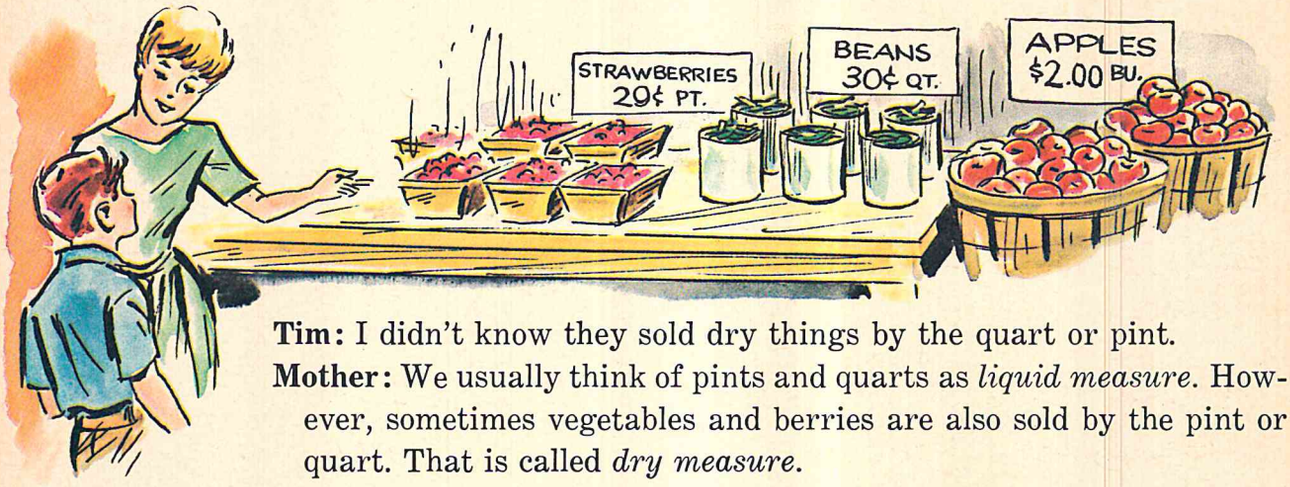
Check Bill's answers with page 69.

**Tim:** I thought we bought potatoes by the pound.
**Father:** When we want a large quantity, it is cheaper to buy them by the peck or bushel.
**Tim:** What is the difference between a peck and a bushel?
**Father:** When we get home I'll make a chart that will show you.

| | | |
|---|---|---|
| 2 pints | = | 1 quart |
| 8 quarts | = | 1 peck |
| 4 pecks | = | 1 bushel |




1. Is it cheaper to buy potatoes by the bushel or by the peck? _____
2. How much cheaper at the prices in the store pictured above? _____
3. How many pecks in a bushel? _____




**Tim:** I didn't know they sold dry things by the quart or pint.
**Mother:** We usually think of pints and quarts as *liquid measure*. However, sometimes vegetables and berries are also sold by the pint or quart. That is called *dry measure*.

4. What is the price of 2 pints of strawberries? _____
5. Tim's mother bought 2 quarts of shelled beans. How many pints was that? _____
6. Tim's father bought a bushel of apples. How many pecks was that? _____
7. They bought $\frac{1}{2}$ bushel of cherries for freezing. How many pecks was that? _____
8. At the above prices, how much would 3 pints of strawberries cost? _____

Check your answers with page 72.

Answers to Tim's test on page 65: I—215, 510, 268, 295, 228, 342, 254, 4536, 3864 II—(1) 18, (2) 12, (3) 9, (4) 24, (5) 14, (6) 13, (7) 15, (8) 17, (9) 7 III—(1) 1 qt., (2) 2 pt., (3) 4 qt., (4) 8 qt., (5) 2 qt., (6) 16 pt., (7) 8 qt., (8) 12 qt., (9) 8 pt. IV—125, 206, 703, 119, 526, 101, 81 V—165 R 1, 197 R 1, 92 R 1, 30 R 3, 135 R 5, 16 R 3, 636 R 5 VI—(1) 24 in., (2) 2 ft., (3) 12 in., (4) 5 yd., (5) 2 ft. 6 in., (6) 13 yd. 1 ft., (7) 108 in., (9) 60 in.
Answers to story problems on page 62: (1) 98¢, (2) 79¢, (3) $2.94, (4) $2.37, (5) $5.31, (6) 57¢

**Tim:** Could I weigh a 25 pound bag of sugar on this scale, Mother?

**Mother:** Look carefully at the numbers. Do you think you could?

**Tim:** The numbers go to 25, so I guess I could. But 25 pounds is the limit for this scale.

**Mother:** You would need a different kind of scale to weigh heavier things.

**Tim:** How about coal or iron? A ton of those would be more than 25 pounds, I know.

**Mother:** A ton is 2000 pounds. That's a lot more.

**Tim:** When we were at the Post Office yesterday, the clerk weighed a letter and he said, "That's two ounces."

**Mother:** There are scales for heavy things and scales for things that are very light in weight.

5 pounds

2 pounds

3 pounds

8 ounces
or $\frac{1}{2}$ pound

4 pounds

MEASUREMENTS OF WEIGHT

16 ounces = 1 pound

2000 pounds = 1 ton

ABBREVIATIONS

ounce – oz.

pound – lb.

ton – T.

Look at the scales. Is the weight listed correct for each?

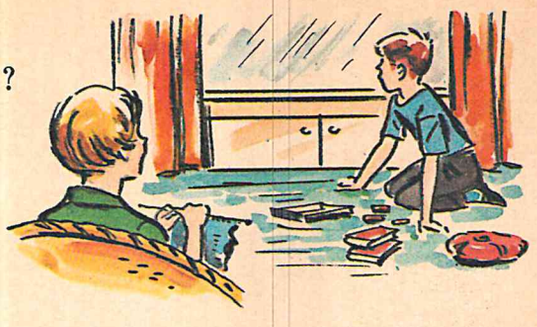
Study the table of weights, then fill in the blanks:

1. 1 pound = _____ ounces
2. $\frac{1}{2}$ pound = _____ ounces
3. $\frac{1}{4}$ pound = _____ ounces
4. 1 ton = _____ pounds
5. 2 tons = _____ pounds
6. 16 ounces = _____ pound

Check your answers with page 73.

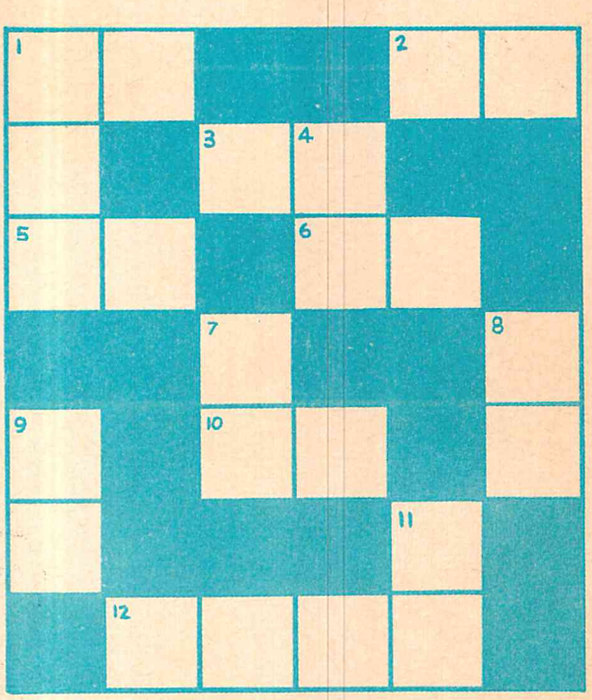
Answers to Bill's test on page 67: I—(1) 60 sec., (2) 52 wk., (3) 60 min., (4) 104 wk., (5) 156 wk., (6) 24 hr., (7) 7 da., (8) 4 yr., (9) 2 da. II—(1) 31, 31, 31, (2) Thursday, (3) 366, (4) Saturday, (5) March III—650, 1480, 1520, 7360, 4860, 1920, 270, 3870, 800, 2030 IV—905, 306, 806, 209, 909, 105, 903 V—$31.32, $31.92, $171.03, $23.82, $152.05, $11.92, $79.96 VI—$4.32, $4.02, $7.03, $180, $35.03

**Tim:** I hate rainy days. There's never anything to do.
**Mother:** Why not experiment with your chemistry set?
**Tim:** I'm tired of that. I wish I could go outdoors.
**Polly:** Let's do some number puzzles.
**Tim:** Good idea! Puzzle Book, here we come!



**Across:**
(1) 1 yard = ? inches?
(2) 2 weeks = ? days?
(3) a dozen = ? things?
(5) a year = ? weeks?
(6) 2 days = ? hours?
(10) a minute = ? seconds?
(12) a ton = ? pounds?

**Down:**
(1) a year = ? days?
(4) a day = ? hours?
(7) a pound = ? ounces?
(8) 1 hour = ? minutes?
(9) 1 foot = ? inches?
(11) $\frac{1}{2}$ hour = ? minutes?



Check your puzzle answers with page 74?

**Tim:** I know all the abbreviations for words that measure all kinds of things. Do you?
**Polly:** I think I do, but I'm not sure. Give me a test, Tim.
**Tim:** Here is a list of words. You write the abbreviation for each one. And remember, an abbreviation must be followed by a period.

| | | | |
|---|---|---|---|
| inch _____ | yard _____ | foot _____ | year _____ |
| hour _____ | day _____ | minute _____ | second _____ |
| month _____ | week _____ | dozen _____ | pound _____ |
| ounce _____ | ton _____ | pint _____ | quart _____ |
| gallon _____ | | | |

Check these with page 79.

Answers to Tim's test on page 66: I—(1) 60 sec., (2) 52 wks., (3) 60 min., (4) 7 da., (5) 36 mo., (6) 2 yr., (7) 12 mo., (8) 600 sec., (9) 24 hr. II—(1) 31, 30, 30, 31, (2) Leap Year, (3) Tuesday, (4) 4, (5) Tuesday III—560, 940, 3320, 2320, 1080, 1380, 720, 3060, 3050, 6440 IV—509, 204, 608, 103, 202, 101, 309, 508 V—$15.48, $45.78, $32.25, $47.58, $24.90, $19.30, $71.50 VI—$2.34, $2.04, $3.07, $1.50, $45.13

**Mother:** Dad and I will be leaving soon for the evening. Miss Lee is coming to stay with you.

**Tim:** Aw, Mom, I'm too big for a sitter. What will the other kids say?

**Mother:** Miss Lee isn't really a sitter. She is a student at the University and she is studying to be an arithmetic teacher.

**Tim:** I get it. She will help me so I can get ahead of the other kids in my class. Oh, boy! A private tutor!

**Mother:** Your teacher says that lately you have been doing well in arithmetic and your father and I want you to keep up the good work. Miss Lee may be able to give you some pointers.

**Tim:** Wait until I tell Bill about this. You and Dad go on. See you in the morning.

Can you do the problems Miss Lee helped Tim with?

Column A

$4 \times 8 + 2 = 34$

$5 \times 4 + 8 =$

$3 \times 6 + 7 =$

$8 \times 9 + 4 =$

$9 \times 5 + 6 =$

$6 \times 5 + 3 =$

$8 \times 2 + 4 =$

$9 \times 0 + 0 =$

$7 \times 9 + 7 =$

$9 \times 9 + 7 =$

$7 \times 3 + 9 =$

$2 \times 9 + 6 =$

Column B

$54 \div 9 - 3 = 3$

$27 \div 3 - 6 =$

$45 \div 5 - 3 =$

$24 \div 4 - 6 =$

$72 \div 9 - 6 =$

$36 \div 4 - 2 =$

$56 \div 7 - 4 =$

$16 \div 8 - 0 =$

$24 \div 2 - 8 =$

$63 \div 7 - 5 =$

$64 \div 8 - 8 =$

$42 \div 6 - 5 =$

1. When Tim finished the above problems, he had solved 12 in column A and 12 in column B. How many did he solve altogether? _____
2. If it took Tim 9 minutes to do column A and 13 minutes to do column B, how long did it take to solve all the problems? _____
3. It is now 7:06. Tim wants to see a TV program at 7:45. How long will he have to wait? _____
4. Tim's parents will be gone from 7:00 P.M. until midnight. Miss Lee will be paid 75¢ per hour. How much will she be paid? _____

Check your answers with page 74.

**Tim:** Boy, am I *happy!* Where's my snack? I'm starved.
**Mother:** What are you happy about?
**Tim:** Believe it or not, I'm happy about *arithmetic.*
**Mother:** Here's your snack. Now, tell me all about it.
**Tim:** My teacher told me that I had made more progress than anyone in the class. And did *that* make me feel *good!*
**Mother:** You have worked hard, Tim. You deserve praise.
**Tim:** We are having another review tomorrow. As soon as I finish my snack I'm going to practice some more arithmetic.
**Mother:** How about starting with addition?

Row A

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | 53 | 43 | 54 | 63 | 50 | 22 | 71 | 84 | 93 | 57 |
| +35 | +44 | +35 | +43 | +51 | +38 | +46 | +85 | +35 | +46 | +60 |

Row B

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 345 | 612 | 537 | 406 | 245 | 714 | 690 | 533 | 832 |
| +234 | +376 | +442 | +593 | +852 | +465 | +708 | +966 | +565 |

Row C

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 76 | 18 | 67 | 59 | 28 | 39 | 38 | 25 | 34 | 45 |
| +36 | +29 | +46 | +43 | +75 | +96 | +63 | +34 | +67 | +78 | +96 |

Row D

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 735 | 236 | 549 | 358 | 648 | 537 | 265 | 354 | 709 |
| +346 | +728 | +432 | +814 | +543 | +648 | +908 | +429 | +534 |

Row E

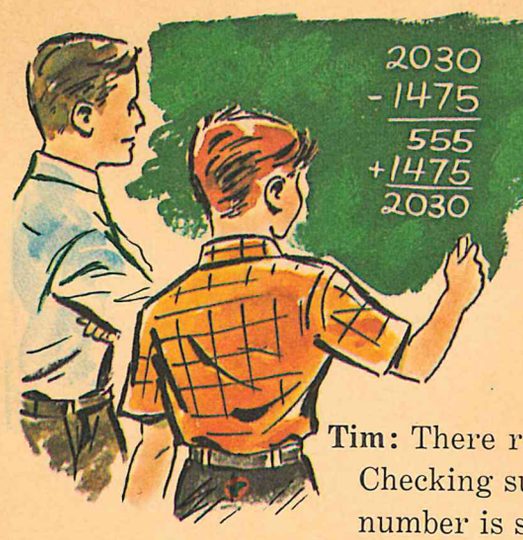
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 257 | 466 | 320 | 174 | 815 | 729 | 564 | 957 | 216 |
| 121 | 632 | 746 | 312 | 553 | 270 | 432 | 731 | 831 |
| +611 | +300 | +432 | +323 | +630 | +832 | +343 | +147 | +394 |

Row F

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 7 | 2 | 5 | 8 | 9 | 3 | 1 | 4 | 9 | 2 | 7 |
| 3 | 2 | 6 | 7 | 1 | 0 | 6 | 5 | 8 | 7 | 9 | 5 |
| +4 | +7 | +8 | +4 | +9 | +5 | +7 | +4 | +7 | +3 | +7 | +5 |

Check your answers with page 75.

Answers for problems on page 68: (1) bushel, (2) 20¢, (3) 4 pints, (4) 58¢, (5) 4 pints, (6) 4 pecks, (7) 2 pecks, (8) 87¢




**Tim:** I certainly learned *one* lesson the hard way.

**Father:** What is that?

**Tim:** I finally believe what everyone tried to tell me about subtraction.

**Father:** I don't know what you mean.

**Tim:** There really is a connection between addition and subtraction. Checking subtraction problems by adding the answer to the second number is sure fire. That way I *know* whether I'm right or wrong. Here, I'll show you what I mean.

Solve these problems, then check each answer the way Tim did:

Row A

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 47 | 25 | 32 | 31 | 43 | 81 | 28 | 24 | 10 | 26 |
| —8 | —9 | —9 | —5 | —7 | —4 | —5 | —9 | —8 | —6 | —7 |

Row B

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 764 | 895 | 657 | 749 | 746 | 285 | 493 | 576 | 689 |
| —432 | —523 | —315 | —207 | —514 | —173 | —280 | —345 | —427 |

Row C

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 928 | 547 | 516 | 539 | 746 | 968 | 457 | 682 | 758 |
| —634 | —172 | —343 | —281 | —565 | —474 | —372 | —492 | —593 |

Row D

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 246 | 578 | 675 | 497 | 342 | 934 | 823 | 600 | 800 |
| —97 | —379 | —296 | —398 | —153 | —687 | —574 | —395 | —642 |

Check the answers by adding.

Answers to Bill's test on page 64: I—170, 348, 304, 475, 201, 747, 434, 5922, 3072 II—(1) 12, (2) 25, (3) 9, (4) 28, (5) 21, (6) 5, (7) 6, (8) 20, (9) 15 III—(1) 2 qt., (2) 1 gal., (3) 1 qt., (4) 4 qt., (5) 1 gal., (6) 5 qt., (7) 2 gal., (8) 4 gal., (9) 3 qt. IV—53, 272, 307, 191, 409, 100, 103 V—231 R 1, 296 R 1, 240 R 3, 102 R 3, 71 R 2, 82 R 3, 206 R 2 VI—(1) 1 ft., (2) 24 in., (3) 1 yd., (4) 27 ft., (5) 1 yd. and 1 ft., (6) 2 ft. and 5 in., (7) 2 yds., (8) 4 yds.

Answers for problems on page 69: (1) 16 ounces, (2) 8 ounces, (3) 4 ounces, (4) 2000 pounds, (5) 4000 pounds, (6) 1 pound

Bill and Tim practiced multiplication by solving these problems. Tim finished before Bill. Neither boy made a mistake. How well can you do?

Row A

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 51 ×9 | 43 ×3 | 82 ×4 | 64 ×2 | 70 ×6 | 52 ×4 | 234 ×2 | 413 ×3 | 324 ×2 | 123 ×2 |

Row B

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 74 ×4 | 18 ×3 | 62 ×6 | 53 ×5 | 54 ×7 | 82 ×8 | 72 ×9 | 92 ×6 | 42 ×5 | 26 ×3 | 58 ×4 |

Row C

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 326 ×2 | 424 ×3 | 115 ×5 | 135 ×2 | 138 ×2 | 229 ×3 | 236 ×2 | 124 ×3 | 317 ×5 |

Row D

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 220 ×4 | 340 ×3 | 650 ×5 | 750 ×2 | 860 ×2 | 407 ×6 | 806 ×5 | 903 ×7 | 604 ×8 |

Row E

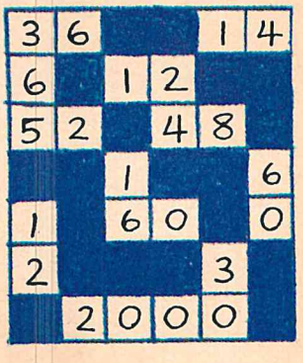
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32 ×10 | 56 ×30 | 78 ×20 | 42 ×40 | 65 ×50 | 84 ×60 | 93 ×30 | 79 ×20 | 48 ×50 | 73 ×40 | 96 ×40 |

Row F

| | | | | |
|---|---|---|---|---|
| 223 ×25 | 423 ×32 | 523 ×43 | 632 ×46 | 742 ×23 | 834 ×42 |

Check your answers with page 76.

Answer for page 70:




**Just for Fun**—Why is 6,000,000 a very bad number? (Answer: Because it is so *naughty*. (Naught sometimes means nothing, or zero.)

**Just for Fun**—How can you divide a dollar into fifty coins? (Answer: 40 pennies, 8 nickels, and 2 dimes)

Answers for problems on page 71: Column A—34, 28, 25, 76, 51, 33, 20, 0, 70, 88, 30, 24 Column B—3, 3, 6, 0, 2, 7, 4, 2, 4, 4, 0, 2 Story problems—(1) 24, (2) 22 min., (3) 39 min., (4) $3.75

Division is easy for Tim now. He likes to prove that his answers are correct. Do these, then check each answer by multiplying.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4/48 | 3/63 | 5/55 | 2/24 | 3/99 | 2/26 | 4/84 | 7/77 |
| 2/80 | 4/40 | 3/90 | 8/160 | 7/140 | 9/270 | 2/248 | |
| 3/963 | 4/884 | 2/844 | 3/669 | 4/224 | 5/165 | 3/141 | |
| 6/264 | 7/161 | 8/272 | 9/207 | 3/315 | 4/816 | 2/614 | |
| 7/735 | 8/832 | 9/927 | 9/963 | 3/636 | 2/198 | 5/520 | |

Each of these will have a remainder:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2/7 | 3/22 | 4/23 | 3/29 | 2/15 | 6/38 | 8/35 | 9/40 |
| 3/95 | 4/46 | 5/57 | 2/69 | 6/127 | 7/219 | 8/169 | |

| | | | |
|---|---|---|---|
| $\frac{1}{2}$ of 12 = | $\frac{1}{2}$ of 24 = | $\frac{1}{4}$ of 12 = | $\frac{1}{4}$ of 32 = |
| $\frac{1}{3}$ of 36 = | $\frac{1}{5}$ of 45 = | $\frac{1}{3}$ of 96 = | $\frac{1}{5}$ of 105 = |
| $\frac{1}{2}$ of 42 = | $\frac{1}{5}$ of 20 = | $\frac{1}{6}$ of 126 = | $\frac{1}{4}$ of 100 = |

Check these answers with page 76.

Answers to problems on page 72: Row A—77, 97, 78, 97, 114, 88, 68, 156, 119, 139, 117 Row B—579, 988, 979, 999, 1097, 1179, 1398, 1499, 1397 Row C—84, 105, 64, 110, 134, 124, 102, 72, 92, 112, 141 Row D—1081, 964, 981, 1172, 1191, 1185, 1173, 783, 1243 Row E—989, 1398, 1498, 809, 1998, 1831, 1339, 1835, 1441 Row F—13, 16, 16, 16, 18, 14, 16, 10, 19, 19, 18, 17

## ONE HUNDRED ADDITION FACTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +1 | +1 | +1 | +1 | +1 | +1 | +1 | +1 | +1 | +1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +2 | +2 | +2 | +2 | +2 | +2 | +2 | +2 | +2 | +2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +3 | +3 | +3 | +3 | +3 | +3 | +3 | +3 | +3 | +3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +4 | +4 | +4 | +4 | +4 | +4 | +4 | +4 | +4 | +4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +5 | +5 | +5 | +5 | +5 | +5 | +5 | +5 | +5 | +5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +6 | +6 | +6 | +6 | +6 | +6 | +6 | +6 | +6 | +6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +7 | +7 | +7 | +7 | +7 | +7 | +7 | +7 | +7 | +7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +8 | +8 | +8 | +8 | +8 | +8 | +8 | +8 | +8 | +8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| +9 | +9 | +9 | +9 | +9 | +9 | +9 | +9 | +9 | +9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| +0 | +0 | +0 | +0 | +0 | +0 | +0 | +0 | +0 | +0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

**Just for Fun**—What is the difference between twice 25 and twice 5 and 20? (Answer: The difference is 20 because twice 25 is 50 and twice 5 and 20 is 30.)

Answers to problems on page 74: Row A—459, 129, 328, 128, 420, 208, 468, 1239, 648, 246 Row B—296, 54, 372, 265, 378, 656, 648, 552, 210, 78, 232 Row C—652, 1272, 575, 270, 276, 687, 472, 372, 1585 Row D—880, 1020, 3250, 1500, 1720, 2442, 4030, 6321, 4832 Row E—320, 1680, 1560, 1680, 3250, 5040, 2790, 1580, 2400, 2920, 3840 Row F—5575, 13536, 22489, 29072, 17066, 35028

Answers for page 75: 6, 12, 21, 12, 9, 4, 3, 32, 21, 8, 21, 25

## ONE HUNDRED SUBTRACTION FACTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| −0 | −0 | −0 | −0 | −0 | −0 | −0 | −0 | −0 | −0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| −1 | −1 | −1 | −1 | −1 | −1 | −1 | −1 | −1 | −1 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| −2 | −2 | −2 | −2 | −2 | −2 | −2 | −2 | −2 | −2 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| −3 | −3 | −3 | −3 | −3 | −3 | −3 | −3 | −3 | −3 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| −4 | −4 | −4 | −4 | −4 | −4 | −4 | −4 | −4 | −4 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| −5 | −5 | −5 | −5 | −5 | −5 | −5 | −5 | −5 | −5 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| −6 | −6 | −6 | −6 | −6 | −6 | −6 | −6 | −6 | −6 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| −7 | −7 | −7 | −7 | −7 | −7 | −7 | −7 | −7 | −7 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| −8 | −8 | −8 | −8 | −8 | −8 | −8 | −8 | −8 | −8 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| −9 | −9 | −9 | −9 | −9 | −9 | −9 | −9 | −9 | −9 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

## FACTS WORTH REMEMBERING

TIME MEASUREMENTS

1 year = 365 days
1 year = 12 months
1 month = 4 weeks
1 week = 7 days
1 day = 24 hours
1 hour = 60 minutes
1 minute = 60 seconds

LIQUID MEASURE

2 cups = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon

**Abbreviations:**
pint—pt.
quart—qt.
gallon—gal.

DRY MEASUREMENTS

2 pints = 1 quart
8 quarts = 1 peck
4 pecks = 1 bushel

**Abbreviations:**
peck—pk.
bushel—bu.

**Just for Fun**—When you buy five cents worth of jelly beans, what do you want them for? (Answer: Five cents)

## ONE HUNDRED MULTIPLICATION FACTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 × 0 = 0 | 0 × 1 = 0 | 0 × 2 = 0 | 0 × 3 = 0 | 0 × 4 = 0 | 0 × 5 = 0 | 0 × 6 = 0 | 0 × 7 = 0 | 0 × 8 = 0 | 0 × 9 = 0 |
| 1 × 0 = 0 | 1 × 1 = 1 | 1 × 2 = 2 | 1 × 3 = 3 | 1 × 4 = 4 | 1 × 5 = 5 | 1 × 6 = 6 | 1 × 7 = 7 | 1 × 8 = 8 | 1 × 9 = 9 |
| 2 × 0 = 0 | 2 × 1 = 2 | 2 × 2 = 4 | 2 × 3 = 6 | 2 × 4 = 8 | 2 × 5 = 10 | 2 × 6 = 12 | 2 × 7 = 14 | 2 × 8 = 16 | 2 × 9 = 18 |
| 3 × 0 = 0 | 3 × 1 = 3 | 3 × 2 = 6 | 3 × 3 = 9 | 3 × 4 = 12 | 3 × 5 = 15 | 3 × 6 = 18 | 3 × 7 = 21 | 3 × 8 = 24 | 3 × 9 = 27 |
| 4 × 0 = 0 | 4 × 1 = 4 | 4 × 2 = 8 | 4 × 3 = 12 | 4 × 4 = 16 | 4 × 5 = 20 | 4 × 6 = 24 | 4 × 7 = 28 | 4 × 8 = 32 | 4 × 9 = 36 |
| 5 × 0 = 0 | 5 × 1 = 5 | 5 × 2 = 10 | 5 × 3 = 15 | 5 × 4 = 20 | 5 × 5 = 25 | 5 × 6 = 30 | 5 × 7 = 35 | 5 × 8 = 40 | 5 × 9 = 45 |
| 6 × 0 = 0 | 6 × 1 = 6 | 6 × 2 = 12 | 6 × 3 = 18 | 6 × 4 = 24 | 6 × 5 = 30 | 6 × 6 = 36 | 6 × 7 = 42 | 6 × 8 = 48 | 6 × 9 = 54 |
| 7 × 0 = 0 | 7 × 1 = 7 | 7 × 2 = 14 | 7 × 3 = 21 | 7 × 4 = 28 | 7 × 5 = 35 | 7 × 6 = 42 | 7 × 7 = 49 | 7 × 8 = 56 | 7 × 9 = 63 |
| 8 × 0 = 0 | 8 × 1 = 8 | 8 × 2 = 16 | 8 × 3 = 24 | 8 × 4 = 32 | 8 × 5 = 40 | 8 × 6 = 48 | 8 × 7 = 56 | 8 × 8 = 64 | 8 × 9 = 72 |
| 9 × 0 = 0 | 9 × 1 = 9 | 9 × 2 = 18 | 9 × 3 = 27 | 9 × 4 = 36 | 9 × 5 = 45 | 9 × 6 = 54 | 9 × 7 = 63 | 9 × 8 = 72 | 9 × 9 = 81 |

## FACTS WORTH REMEMBERING

MONEY

a penny = 1 cent
5 cents = 1 nickel
10 cents = 1 dime
25 cents = 1 quarter
50 cents = $\frac{1}{2}$ dollar
100 cents = 1 dollar

WEIGHT MEASUREMENTS

1 pound = 16 ounces
2000 pounds = 1 ton

**Abbreviations:**

Ounce—oz.
Pound—lb.
Ton—T.

## NINETY DIVISION FACTS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1<br>1/1 | 2<br>1/2 | 3<br>1/3 | 4<br>1/4 | 5<br>1/5 | 6<br>1/6 | 7<br>1/7 | 8<br>1/8 | 9<br>1/9 |
| 1<br>2/2 | 2<br>2/4 | 3<br>2/6 | 4<br>2/8 | 5<br>2/10 | 6<br>2/12 | 7<br>2/14 | 8<br>2/16 | 9<br>2/18 |
| 1<br>3/3 | 2<br>3/6 | 3<br>3/9 | 4<br>3/12 | 5<br>3/15 | 6<br>3/18 | 7<br>3/21 | 8<br>3/24 | 9<br>3/27 |
| 1<br>4/4 | 2<br>4/8 | 3<br>4/12 | 4<br>4/16 | 5<br>4/20 | 6<br>4/24 | 7<br>4/28 | 8<br>4/32 | 9<br>4/36 |
| 1<br>5/5 | 2<br>5/10 | 3<br>5/15 | 4<br>5/20 | 5<br>5/25 | 6<br>5/30 | 7<br>5/35 | 8<br>5/40 | 9<br>5/45 |
| 1<br>6/6 | 2<br>6/12 | 3<br>6/18 | 4<br>6/24 | 5<br>6/30 | 6<br>6/36 | 7<br>6/42 | 8<br>6/48 | 9<br>6/54 |
| 1<br>7/7 | 2<br>7/14 | 3<br>7/21 | 4<br>7/28 | 5<br>7/35 | 6<br>7/42 | 7<br>7/49 | 8<br>7/56 | 9<br>7/63 |
| 1<br>8/8 | 2<br>8/16 | 3<br>8/24 | 4<br>8/32 | 5<br>8/40 | 6<br>8/48 | 7<br>8/56 | 8<br>8/64 | 9<br>8/72 |
| 1<br>9/9 | 2<br>9/18 | 3<br>9/27 | 4<br>9/36 | 5<br>9/45 | 6<br>9/54 | 7<br>9/63 | 8<br>9/72 | 9<br>9/81 |
| 0<br>1/0 | 0<br>2/0 | 0<br>3/0 | 0<br>4/0 | 0<br>5/0 | 0<br>6/0 | 0<br>7/0 | 0<br>8/0 | 0<br>9/0 |

## FACTS WORTH REMEMBERING

LENGTH MEASUREMENTS

1 foot = 12 inches
3 feet = 1 yard
1 mile = 5280 feet

**Days in a Month:**

January—31
February—28 or 29
March—31
April—30
May—31
June—30
July—31
August—31
September—30
October—31
November—30
December—31

(Leap Year comes every four years and gives February an extra day, making 29. There are 366 days in Leap Year.)

**Abbreviations:**

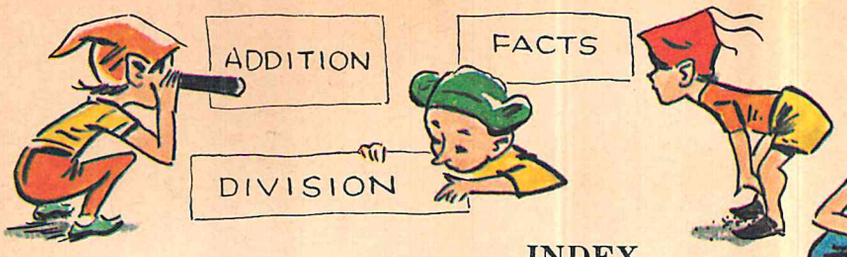
year—yr.
month—mo.
week—wk.
day—da.
hour—hr.
minute—min.
second—sec.

**Abbreviations:**

inch—in.
foot—ft.
yard—yd.
mile—mi.

ROMAN NUMERALS

| | |
|---|---|
| I—1 | X—10 |
| II—2 | XI—11 |
| III—3 | XII—12 |
| IV—4 | XIII—13 |
| V—5 | XIV—14 |
| VI—6 | XX—20 |
| VII—7 | XL—40 |
| VIII—8 | L—50 |
| IX—9 | C—100 |



## INDEX

ADDITION—P. 7, 8, 10, 72
In Columns—P. 12, 13, 63, 72
With Carrying—P. 12, 13, 19, 29, 46, 63, 71, 72

DIVISION—P. 18, 19, 20, 21, 22, 24, 25, 26, 29, 62, 71, 75
Larger Numbers—P. 42, 43, 44, 46, 58, 62, 64, 65, 75
Zero in Quotient—P. 45, 60, 66, 67, 75
With Remainder—P. 48, 49, 59, 64, 65, 75

ESTIMATING THE ANSWER—P. 47

FACTS—P. 76, 77, 78, 79

FRACTIONS—P. 36, 37, 38, 39, 46, 64, 65

MEASURING
Dry Measure—P. 68
Length—P. 50, 51, 64, 65
Liquid—P. 40, 41, 64, 65
Temperature—P. 53, 58
Time—P. 30, 54, 55, 58, 66, 67
Weight—P. 52, 69

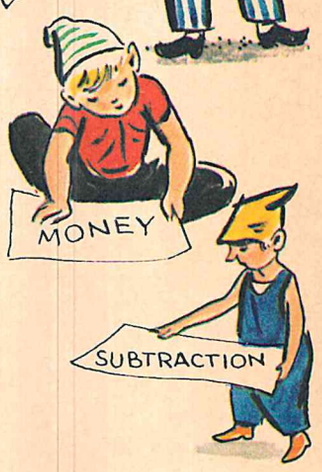
MONEY—P. 13, 61, 62, 66, 67

MULTIPLICATION—P. 18, 19, 20, 21, 22, 24, 26, 29, 32, 33, 34, 58, 71, 74
With Carrying—P. 35, 46, 61, 64, 65, 74
By Tens—P. 56, 74
Larger Numbers—P. 57, 58, 66, 67, 74

PLACE VALUES—P. 4, 5, 6, 29

PUZZLES—P. 16, 27, 70

ROMAN NUMERALS—P. 31, 46

STORY PROBLEMS—P. 17, 19, 20, 23, 24, 25, 28, 33, 38, 39, 40, 41, 43, 44, 47, 58, 59, 68, 71

SUBTRACTION—P. 7, 9, 11, 73
With Borrowing—P. 14, 15, 17, 19, 29, 46, 71, 73